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ABSTRACT

Developed by representatives from state guidance, education, and employment, this resource guide was designed to facilitate the integration of career education concepts into the curriculum of junior high schools. Recognizing that career development is a life-long process, learning experiences to develop work concepts and attitudes are outlined for: (1) English, (2) mathematics, (3) physical and life sciences, (4) social studies, (5) art, (6) home economics, (7) industrial arts, and (8) physical education. Most of the activities are concerned with development of attitudes and skills associated with vocational awareness, and are designed for teachers who are concerned about, but not necessarily trained in, vocational learning-maturation. Activities emphasize work functions and worker trait components and exposure to relevant concepts, and should be adapted by the teacher and used with other related tools. In addition to identifying concepts to be taught, the guide also outlines content, teaching techniques, and resources. Included in the appendixes are data on classifying occupations. (JS)

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VOCATIONAL DEVELOPMENT IN GRADES SEVEN, EIGHT AND NINE

A resource guide suggesting
selected vocational development
strategies with eight areas of the
curriculum in grades seven, eight
and nine

GOVERNMENT EDUCATION
INDUSTRY

DEVELOPED BY:

- The Mid-Hudson Career Development and Information Center

In Concert With:

- The Bureau of Guidance
  New York State Education Dept.
- The Division of Occupational Education
  New York State Education Dept.
- The Division of Employment
  New York State Dept. of Labor
- The Mid-Hudson Industrial Association

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VOCATIONAL DEVELOPMENT IN GRADES SEVEN, EIGHT AND NINE

—a resource guide integrating selected vocational development concepts with eight areas of the curriculum in grades seven, eight and nine

GOVERNMENT
EDUCATION
INDUSTRY

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ROBERT HOPPOCK
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Recent research has revealed that some students, as early as the third grade, block out whole areas of potential employment from any further consideration. We do not know why. Perhaps social status has something to do with it.

The rejection of "the system" by some of today's alienated youth blocks out other areas of employment as unacceptable.

Limited acquaintance with - even ignorance of - many occupations effectively eliminates them from consideration in career planning.

Suspecting that some of these obstacles to wholesome vocational development may have their origins in, or be reinforced by, the attitudes of teachers and counselors and the nature of the school curriculum, several school systems are now exploring ways of introducing more and better information about occupations into the school program at every level from the kindergarten on up.

One of the organizations involved in this pioneer effort is the Mid-Hudson Career Development and Information Center, under the dynamic and inventive leadership of Robert W. Schreiber. One of the activities of the Center has been a summer workshop for teachers, in which they have sought to devise ways in which they could introduce more and better career information into their own classes. With the help of a distinguished counselor educator, Professor Harold Munson of the University of Rochester, the teachers have produced the plans presented in this report.

Probably no two teachers can teach equally well by the same method; but resourceful, innovative teachers often pick up useful ideas from each other. And ideas are what we need today. No one will know how good any of the ideas is until it has been tried and the results evaluated. But step number one is to produce the ideas. Here are some of them.

Robert Hoppock

Robert Hoppock
Professor of Counselor Education
New York University

FOREWORD

I am proud to have an opportunity to endorse with deep enthusiasm the objectives of the Grade Seven through Nine Curriculum Guide, produced by the Mid-Hudson Career Development and Information Center.

This publication, and the program which created it, are dedicated to meeting a most pressing need in our contemporary society: the enhancing of the effectiveness of our youth's vocational training and their preparation for work.

The focus of this Guide, which is intended to be used with other related tools, is threefold. First, it is designed to improve teachers' abilities to communicate with and educate their students concerning vocational attitudes and opportunities. By presenting teachers with creative and stimulating instructional techniques and acquainting them with resources and opportunities available for their use, it opens the way for more vital and interesting presentations and discussions of the world of work.

Second, the Guide is presented as a tool which can be used by our schools in their efforts to improve the ways in which they discharge their responsibilities to our future citizens, their parents and our communities. As our schools plan and design their curricula, they will be able to use the Guide to create explicit and honest situations whereby students will systematically be exposed to and educated about the careers and jobs which await them as adults.

Third, the Guide is intended to enhance the smooth functioning and viability of our interlocking social institutions. By identifying and showing students ways to deal successfully with some of our most important adult institutions, it enables our educational establishment to be more useful and more responsive to the real needs of our youth, our employers, and our governments.

In these ways, the bold and forward-looking initiative which this Guide represents will help our children grow up to become better, more productive individuals, citizens and workers. As such, they will be able and eager to help us all build a better nation and a better world.

Dr. Douglas M. Knight
Division Vice President
Education Services
RCA, CORPORATION

PREFACE

The significance of career development in the seventh decade of the twentieth century needs additional understanding by teachers and by the general public. This resource guide for Vocational Development in Grades 7, 8, and 9 merits the attention of all who are interested in a cooperative approach to the improvement of career education. The guide should be of value to other States and regions seeking to re-examine and to re-evaluate their present curricular practices.

The cooperative approach which led to the production of the guide merits equal attention with its contents. Involved in the approach were 20 teachers, numerous persons from the eleven cooperating industries, a representative from the New York State Department of Labor and a university professor. These human resources were brought together by the Mid-Hudson Career Development and Information Center to narrow the distance between the world of work and the world of education.

The participating teachers experienced a six weeks two hours per week session preliminary to, a summer job in industry of four weeks duration, followed by a two-weeks writing seminar.

Nine Mid-Hudson business firms supplied the summer jobs for the teachers in a time of economic retrenchment. In addition, they encouraged the full cooperation of their personnel with the teachers in the project.

Professor Munson was the catalyst who enabled the teachers to synergize their creativity and their summer work experiences to develop new ways of relating the regular school subjects to the world of work and of making this information available to their students and to other teachers.

Everyone involved in the development of the resource guide recognizes fully that the concepts, techniques and resources set forth in the document are far from the final answer to the problem of career development. The cooperative approach, together with the completed document, is a positive move in a direction which holds great promise. As an alternate to current curricular and instructional practices, it merits close study.

Richard B. Scheetz, Coordinator
School-Industry Cooperation
New Jersey State Department
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ACKNOWLEDGEMENTS

The groundswell of a national movement to enhance the career development of all students is upon us. A need to develop positive attitudes toward work has been recognized by industry, government and education. Teachers and administrators at all levels have been challenged to make education more relevant.

Because of the desire of industrialists, businessmen and educators in the Mid-Hudson Valley to do something constructive about these needs, this curriculum resource guide was developed.

Dr. Harold L. Munson, Chairman, Department of Guidance and Student Personnel, University of Rochester, with the able assistance of Mr. William Howard, is most responsible for the development of this document. Without his dynamic leadership to stimulate and encourage the participants little progress would have been made.

To each "teacher writer" has come the task of plowing up his subject matter field and sowing that field with the seeds of a new approach to teaching. The satisfaction of a job well done rests with each of them.

Dr. William Moran, Superintendent of Valley Central School District, Montgomery, New York and Mr. Robert W. Musgrove, Superintendent of Beacon City School District have earned our appreciation for providing the physical facilities within which this document was born and for opening the libraries, offices and classrooms to our use.

The insight to, and understanding of, the world of work on the part of the "teacher-writers" is a direct result of the efforts of the cooperating industries. In a period of business recession and unemployment, these firms gave of themselves to hire our teachers for work experience in the months of July and August. This document could not have been written without these experiences, and the dedication of local industries and businessmen to this task is a fine example of cooperation between industry and education in the Mid-Hudson Valley.

We owe sincere appreciation to the many secretaries in both the Beacon City and Valley Central School Districts for their contributions in typing our rough and finished copy, most especially Mrs. Anna Romano and Miss Sandy Morrison.

The Department of Occupational Education, New York State Education Department and the Mid-Hudson Industrial Association provided the funds for this project and should be congratulated for their dedication and farsightedness in recognizing the value of these developments in the curriculum of grades 7, 8, and 9.

Robert W. Schreiber, Director
Mid-Hudson Career Development
and Information Center

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The following dedicated people gave freely of their time and energy to help in the development and evaluation of this manuscript.

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PARTICIPATING BUSINESS FIRMS AND INDUSTRIAL ORGANIZATIONS

The following firms and people gave of themselves to provide the work experiences for teachers that were so essential to our task.

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St. Francis Hospital	Mrs. Joan Coughlin Vice President
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INTRODUCTION

Over the years considerable attention has been given to the possibilities for integrating concepts and ideas about the world of work into the various subject matter areas of the school curriculum. A great many words have been written but there has been very little action! This document represents an attempt to translate some of these ideas to curriculum practice. It is a beginning. To my knowledge, it is the first attempt by a group of secondary school teachers to examine these opportunities and relationships and to determine the means for using the curriculum of the secondary school to serve the vocational development of the learner.

The vocational development of the individual involves far more than the mere provision for occupational information. It entails more than the traditional forms of vocational guidance as we have understood and experienced them in the past. We can no longer continue to think of vocational development in the limited sense of providing information about job opportunities and requirements. We can no longer continue to focus all our efforts on vocational choice as if it were a once-in-a-lifetime act of "picking an occupation." Vocational development is a continual and progressive process of learning and maturing. It begins very early and continues throughout life. It cannot be left to chance. In a society as complex as ours, we must plan exposures and experiences that will provide for the positive development of attitudes and understandings about the world of work and the individual's role in it.

Recent research and theory suggest a number of concepts that can be useful in planning newer directions for vocational learning-maturation in the secondary school. Some of the concepts we can use to guide our practice include the following:

"(1) Vocational development is a process extending over a long period of time - perhaps a lifetime.

(2) Vocational development is concerned with those physiological, psychological, sociological, and economic forces impinging on the decisions of an individual making both internal (personal) and external (environmental) considerations necessary and significant.

(3) Vocational development consists of a series of decisions which eventuate, over a period of time, in occupational involvement.

(4) Vocational development is experiental in nature, necessitating trial-exploratory behavior of a real and simulated nature allowing one to explore further his self and self-in-vocation.

(5) Vocational development is the progressive and compromising process of achieving self-identity in work roles."[1]

Vocational learning-maturation is concerned both with attitudes and skills. We need to be concerned that the young person in our schools has an exposure to work, work functions, and work roles and that he has ample opportunity to develop or assess his own attitudes about these matters. Further, he needs experiences which will help him to think significantly about his own responsibility for making the many choices and decisions attendant to the evolvement of his own career pattern. If we truly intend to ensure that individuals have a thorough exposure to the range of feelings, beliefs and ideas that are associated with vocational development, we must provide for these exposures early and often during the years when these attitudes are being developed.

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[1] Munson, Harold L., Foundations of Developmental Guidance. Boston: Allyn and Bacon, 1971, p. 322.

Vocational learning-maturation involves helping the individual to master the skills of mentally processing whatever knowledge he has available and in manipulating this information in decision-making and problem-solving situations. Our focus in the past has been on effecting "occupational choice." In this sense, then, the efforts of the school have been task-centered (picking an occupation) rather than skill-centered (learning how to use competencies in the life long, developmental process of career evolvement). It is time we began to think of developing vocationally oriented skills and attitudes with reference to their usefulness in dealing with the many career decisions and problems which an individual may face periodically in his life. We must provide the individual with opportunities to develop insights and understandings that he can apply to a variety of vocational development concerns as they emerge in the course of his vocational life.

This document seeks to enhance the vocational learning-maturation of the early adolescent. It suggests learning exposures and experiences that are consistent with a process approach to vocational development. Most of the activities are concerned in one way or another with the development of attitudes and skills associated with vocational awareness and/or vocational readiness. They are not isolated learnings for they flow naturally from the content of the subject matter. Teachers do not have to be vocational development experts to deal with these concepts and learnings. They require only that a teacher be concerned with the contributions of the subject to vocational learning-maturation.

The materials in this guide are not intended to change the direction of a course of study nor to alter drastically other objectives that a teacher may have established for any given set of learning experiences. They are intended to supplement regular classroom exposures and to suggest possible techniques for ensuring that vocational concepts be assimilated along with others which the teacher has in mind.

The activities suggested are not designed to provide the learner with all the details associated with particular occupations or job families. While they have been constructed with a variety of learning purposes, many emphasize work functions and worker trait components (abilities, interests, temperaments, training or preparation, physical demands and working conditions) as these are related to the performance of a classroom activity or task. In this sense, then, work in the classroom is much like any job and the student, like a worker, is performing a work function. Many of these activities stress the nature of the work function, the student's understanding of the function, and his assessment of his performance as he engages in the function in the classroom work. In learning about these work functions and work situations in a variety of classroom settings, students can transfer their own insights, understandings and experiences to almost any other type of life experience including occupational experiences. This emphasis does not preclude his learning more about various occupations. In fact, his experience in the classroom may trigger his need or desire to obtain this information. While some of the activities suggest this kind of involvement, the decision to take additional time to investigate the occupational implications of the activity remain with each classroom teacher.

The suggestions for each of the eight subject matter areas treated in this guide have been organized in a manner which the writing committee believed to be most readily adaptable to a variety of teaching-learning situations and to the greatest number of teacher interests and competencies. In most of the areas, the activities emphasize exposure to concepts (broad statements containing ideas or beliefs) rather than to specific facts to be memorized. Provision for exposing students to these concepts has been treated by suggesting one or more techniques or activities for approaching the learning experience. These are intended as ideas or as suggested procedures and it is not expected that teachers will follow them precisely. It is anticipated that teachers will want to adapt these suggestions to their own individual teaching style and preferences. It is hoped that these ideas will provide a base for more creative teaching. Therefore, the techniques have been only very briefly described. Sufficient detail to make explicit the relationship between the concept and the technique has been provided to help the teacher initiate the activity.

This guide is truly an initial effort to provide a much needed emphasis in a long neglected area of human maturation. The classroom teachers who prepared these materials were no different than most teachers. They had to learn what they could do to help young people and they had to explore where to begin. This is the result of their learning.

Harold L. Munson
September 1, 1971

THE ENGLISH CURRICULUM AS IT PERTAINS TO THE VOCATIONAL MATURATION OF JUNIOR HIGH SCHOOL STUDENTS

Prepared by:

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A. LISTENING

Learning to listen is as important in human communication as learning to talk. Certainly, in school and at work, people have to listen. The materials in this section deal primarily with helping students to learn the skills associated with listening.

Our approach is very simple and finds its order in date-oriented work functions. The Dictionary of Occupational Titles suggests seven work functions involved using information or data. These are, in order of their complexity, synthesizing, coordinating, analyzing, compiling, computing, copying and comparing. This material is only a beginning and hopefully will suggest a host of other experiences that you will want to develop.

INTRODUCTION

Communication is an everyday function for everyone. The essence of English is the ability to communicate. Therefore, whether at school or at work, the study of English should have meaning, relevant meaning, for every person. In the materials that follow, communication has been viewed with regard to speaking, listening, reading, composition and literature. All of these areas have been explored but hardly exhausted. Rather, an attempt has been made to relate the realities of communication in life, particularly man's work life to the skills necessary in the mastery of communication techniques.

One assumption has been followed faithfully in developing the suggestions which follow. The communication problems and skills which students encounter in early adolescence are fundamentally the same as those they will face several years hence on the job. In helping them to examine, analyze and enhance their ability to deal with the problems of life as they experience and understand it now, we contribute to their personal maturity and, to the extent that it awakens awarenesses and insights that they can use in making decisions about their occupational future, we have added to their vocational maturity.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
I. COMPARING			
Comparing is a listening skill which involves the judging of readily observable functional, structural, or compositional characteristics (whether similar to or divergent from obvious standards) of data, people, or things.	1. To compare or judge data properly you must have understanding of the data (or information) and how it is being utilized in any situation.	1. Set up several simple listening experiences of a routine nature. Have the students listen and repeat (1) directly and (2) in their own words what they have heard.	Kratoville, Betty L. Listen, My Children & You Shall Hear, 1968 text ed. Interstate. Teaching Language And Literature by Loban, Ryan & Squire P. 185-186, 206-207
Comparing means to evaluate or judge data according to standards familiar to the listener. This comparing or judging may mean that the listener must make a choice as to which data has the most meaning for him.	2. Comparing can be a listening function in which basic information is simple repeated or related to some other data (e.g. repeating numbers, listening for discrepancies or inconsistencies in information, etc.)	2. Role play a more complex listening situation in which conflicting information is presented. Ask the students to make judgments in reporting what they have heard.	
	3. Comparing can be a more complex function in instances where many conflicting sources of data are presented.		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
II. COPYING Copying involves listening in order to transcribe, enter or post data.	1. It is often necessary to pick out the main idea which may be surrounded by supportive material.	1. Simulate a lecture or hearing as follows: a) Set up a role play of a court hearing and assign several members of the class to take down everything that is said. Participant recorders should be permitted to ask members of the hearing to repeat words, to spell names or places with which they are unfamiliar, etc. Repeat the experience sufficiently to allow as many members of the class as possible to participate in the copying function.	Educational Media Index 5 - McGraw-Hill P. 113 Writing & Printing (Development of man's written records) Teaching Langauge & Literature - Loban, Ryan & Squire, Harcourt, Brace & World Inc. P. 201.
	2. The job will often dictate what data is to be posted or transcribed. A secretary often has to take down every word spoken for a letter. This leads to the use of shorthand. Also, in court proceedings or hearings, every word is recorded and reported by court stenographers and reporters.	2a. Lecture to the class (or have one of the students present a talk) and ask the class to transcribe the talk word for word. 2b. Discuss the nature of this experience and the types of situations that can be encountered. 2c. Discuss how modern technology has effected copying functions in the world of work.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
III. COMPUTING Computing involves performing arithmetic operations and reporting on and/or carrying out a prescribed action in relation to them. It does not include counting.	1. Computing requires that a person pay close attention to detail.	1. Have students call for long distance information. Report to the class how the listening skills were connected with numbers. What method did he use in attempting to remember the numbers?	
	2. Communication can be conveyed by numbers as well as words.	2. Have students listen to the stock market figures on the radio. Ask them to talk about their listening skills when pressure or speed are involved.	
		3. Have a local auctioneer visit the class to demonstrate some of the listening/speaking skills involved both as an auctioneer and as a participant.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
IV. COMPILING Compiling involves gathering, collating, or classifying information. Reporting and/or carrying out a prescribed action in relation to the information is frequently involved in the compiling function.	1. People compile data in various different ways.	1. Identify situations where an individual must rely on his ability to listen in gathering or classifying information.	Moray, Neville - Listening & Attention 1970 Penguin
	2. Compiling is basically a data-oriented function.	2. Set up situations in the class where different groups of students listen in order to gather different data from the everyday activities in the classroom.	
	3. The job will indicate which data you wish to gather.	3. Assign a topic - or have the students identify a topic about which they desire information - and have the students compile information about it. Restrict them to sources where listening is the sole vehicle for gathering the data.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
V. ANALYZING			
Analyzing involves examining and evaluating data. Presenting alternative actions in relation to the evaluation is frequently involved.	1. Not being able to pick out the main ideas in listening may lead to misunderstanding and confusion in future actions to be taken.	1. Have students listen to a current speech. Ask them to analyze the speech determining the main ideas. Ask them to discuss what actions they would take based on their analysis of the speech or address.	Barbara, Dominick A. Art of Listening. 1958 Thomas Educational Media Index Vol. 5 McGraw-Hill p. 104. A Golden Treasury of Famous Speeches
Analyzing includes the listening skill of picking out the main idea from what someone says.	2. Investigative procedures are often used in analyzing data. This in turn requires that a person establish rapport with the person giving the data.	2. Discuss a recent school or community incident which happened in the school. Break the class into small groups and ask them to talk about the incident with specific referent to "I saw. . ." or "I heard..." Follow the small group meetings with a class discussion to identify components of listening in the analyzing function.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
After analyzing data a person may be called upon to make a decision concerning some action based on his analysis of that data.	There is an established process for solving problems. Certain jobs require adequate performance under stress when confronted with the critical, the unexpected or when taking risks.	1. Define with the students a problem of concern. Divide the class into buzz groups. (Assign a recorder). The recorder will list the problems which the group has hit upon. ("Break-in" communications; opinions vs facts etc.). 2. Teach how a problem must be attacked according to the problem solving technique. 1) Define the problem 2) Analyze the problem 3) Suggest possible solutions to the problem 4) Develop and compare solutions 5) Select best solution to problem 6) Try out solution to problem 7) Improve final solution 3. Divide the class again. Have the recorder note how successful the techniques were if they were followed (did each person speak etc.). 4. Place the student in a situation where he must analyze data and use the problem solving technique.	Hodgins, Bryce B. Problem Solving in the Classroom 1966 MacMillan Hunt, Earl B. et al - Experiments in Induction 1966 Acadpv.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		5. Have the students discuss whether they favor a job which carries the responsibility of the problem solving technique.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
VI. COORDINATING Coordinating involves determining the time, place, and sequence of operations or actions to be taken on the basis of an analysis of data; executing the determinations and/or reporting on events. There are jobs which require a person to analyze and act on the data which he is given.	1. Most work activities must be thoughtfully planned and sequenced.	1. Ask a member of a class to relate a personal incident or episode involving a problem he had to solve and how he went about solving it. Ask the class to sequence the important elements of the story as they heard it. Discuss the sequence of events and other actions which might have been taken at different times.	Spearritt, Donald Listening Comprehension, A Factor Analysis. 1962 - Verry
	2. Coordinating carries some degree of responsibility for acting on the data given.	2. Relate a scrambled story (with events obviously out of sequence) to the class. Ask them to identify the important events and to place these in proper order.	
	3. Understanding of data is important in sequencing the coordination of data.	3. Divide the class into work work groups to develop and coordinate actions to a school situation.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
VII. SYNTHESIZING Synthesizing involes integrating an analysis of data to discover facts and/or to develop knowledge, concepts or interpretations. (D. O. T.) Many jobs require workers to listen for facts and to separate the facts from the personal interpretations, mis-leading statements or half-truths surrounding the facts. Further, and more importantly, synthesizing necessitates that the individual relate and combine facts to develop new or different meanings and interpretations.	1. A fact is something which can be proved.	1. Ask the students to listen to a specific TV documentary or to view a particular film. Have the students listen for various kinds of data - facts, opinions, interpretations, etc. Follow the listening experience with buzz sessions or a group discussion in which the individuals can exchange their perception of what they heard and how they heard it. As a concluding activity have the students integrate the various data discussed into a concise statement that summarizes the meaning of the particular program or film viewed.	Mecham, Merlin J. et al Test of Listening The Department Publication Audiovisual Aids for Teaching Speech Suggests ways in which these devices may be used and sources of audio-visual materials that are avilable. Do Words Ever Fool You CORF 48 16 MM sd. 11 Min Educational Media Index Vol. 5, p. 90.
	2. A fact is not subject to personal interpretation. However, when one or more facts are combined, a new meaning or interpretation can emerge. In this process, the basic facts are often less obvious and often difficult to identify.		

B. SPEAKING

Verbal communication is our prime mode of relating ourselves to the world and to the other people in it. We rely heavily, perhaps too much so, on speaking. The materials that follow are designed to help students understand the various techniques of speaking as these are used in a variety of people-oriented work functions.

The Dictionary of Occupational Titles identified eight work functions that are oriented toward dealing with people: mentoring, negotiating, instructing, supervising, diverting, persuading, speaking-signaling, and serving. In all of these functions, different forms of verbal communication are vital. The materials that follow will suggest to the teacher of English a number of approaches that can be used in helping students to understand better the nature and role of these work functions and to develop further the verbal skills associated with each one.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Mentoring is a means of communication which is dealing with individuals in terms of their total personality in order to advise, counsel, and/or guide them with regard to problems that may be resolved by legal, scientific, clincial, spiritual, and/or other professional principles.(D.O.T.)	1. When people need help they often go to a person they trust for advice. 2. In mentoring it is vital that one speak clearly and express his ideas exactly. 3. Utilizing the ideas and information gained through mentoring, a person will often reach a decision concering his/her problem.	1. Encourage the students to identify situations in their own life where they have made or might make use of a mentor. 2. Ask students who they turn to when they are bothered by a problem. Why do they turn specifically to that person? 3. Discussion questions for class: What qualities do you prize in another person when you find it necessary to seek advise or counsel? Do people use you as a mentor? 4. Have students draw up a list of occupations in which they believe mentoring is one of the prime functions.	1. Drug Information Center 2. Police Headquarters 3. Hospital Emergency 4. SRA Catalogue Career Information Kit, Grades 9-14. 5. See Appendixes A and B for occupations whose mentoring is a prime function. Such occupations can be identified if the second number to the right of the decimal is 0 (e.g. dentist 072.108)

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Negotiating is a form of communication which involves the exchanging of ideas, information, and opinions with others to formulate policies and programs and/or arrive jointly at decisions, conclusions, or solutions. (D.O.T.)	1. Negotiating often involves a situation or problem where two or more people disagree.	1. Have the students relate incidents in which they have found themselves in a position where they had to negotiate (e.g. family, friends, school).	See Appendixes A and B for jobs with negotiating functions involved (e.g. personnel manager 166.118)
In negotiating, two or more parties present their ideas and a middle ground is often developed for agreement.	2. Negotiating may require that one or both of the parties involved change their original position.	2. Students may report and comment on experiences of a negotiating nature in which they have been involved or which they may have observed (with parents or teachers, at the store, or at work).	
Argumentation is often an element of the negotiating process and sometimes resolution of the problem is impossible. Negotiating usually involves some type of counciliation by either or both parties involved.	3. Negotiating may not be successful between the two parties and a third party must be called in to assist (arbitration).	3. Divide the class into buzz groups to deal with various problems (developed by the class). Have a recorder note and report on the negotiating skills used in working out solutions.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Instructing is a means of communication involving teaching subject matter to others (including animals) through explanation, demonstration, and supervised practice, or making recommendations on the basis of technical disciplines. (D.O.T.)	1. Instructing requires that the instructor know the subject matter (facts) or skills which he is trying to convey.	1. Students can relate how they were instructed or trained to do something (job or pleasure). Have them discuss and analyze the techniques that were used by the instructors.	
Instructing involves the passing on of information or assisting others to achieve new information or skills. There are several approaches and techniques that can be employed in the function of instructing (lecturing, demonstrating, telling or directing, etc.)	2. Instructing requires that the student understand what the instructor is trying to teach.	2. Have a student plan and conduct a demonstration which would draw on elements of the instructing function.	
	3. Instructing assumes that the learner wants to master the information or skills that are being taught.	3. Have the students explain how they taught a trick to an animal. What techniques proved most reliable (Skinner SR method)? Try to help students differentiate between training and teaching.	
		4. Arrange for interested students to instruct other groups of students.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Supervising is a method of communication which involves determining or interpreting work procedures for a group of workers, assigning specific duties to them maintaining harmonious relations among them, and promoting efficiency. (D.O.T.)	1. A supervisor has the responsibility of seeing that work operations are as smoothly and productive as the work task demands.	1. With the help of the class, identify a number of tasks or short term projects that might be conducted. Organize the class in small groups or teams to accomplish the selected tasks. Observe and discuss the relationships which develop between the supervisor and the teacher and the groups.	
Supervising involves responsibility in that the supervisor must keep the operation (or whatever) running smoothly. Supervising involves concern for the function and the feelings of individuals being supervised.	2. Supervising involves being sensitive to the needs and feelings of the people being supervised.	2. Form buzz groups to discuss the different types of communication styles that they have experienced in situations where they were being supervised.	
	3. Supervising can involve any number of people. Supervising responsibilities are often directly related to the number of people involved.		
	4. Communication through the supervising function, can be carried out verbally in many ways (through thoughtful discussions, fear, threats, direct ordering, suggesting, etc.)		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Diverting is a communicative skill which involves amsuing others.	1. People do convey messages through entertaining.	1. Play a record of a folk song. How is entertainment used to convey a message? How does it affect your feelings? (this could be repeated with records utilizing other diverting-oriented talents)	
Diverting is a people oriented function in that the communication is always directed toward amusing or entertaining other people.			
The diverting function usually requires a particular talent or skill. While it does not always rely entirely on verbal communication, many occupations where the diverting function is foremost are primarily verbal in nature.	2. The diverting function usually requires the immediate communcation of a feeling as well as a message. 3. Diverting often focuses on influencing feelings.	2. Have the students discuss times when they utilized the diverting function to accomplish a goal.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Persuading is a communication process involving the influencing of others in favor of a product, service, or point of view. (D.O.T.)	1. Persuading other people is part of everyday communication.	1. Divide the class into groups and have the students talk about how they see themselves both as "influencers" or as "being influenced"	See Appendices A and B for occupations involving the persuading function. (e.g. optician, dispensing - 713.251)
Influencing others is a very common function in our life everyday. Sometimes this involves convincing another person.	2. How we influence others or how we allow others to influence us can be an important part of how we feel about our life.	2. Ask several students to prepare a talk in which they attempt to convince or influence the class.	
In the occupational world, it is often connected to selling.	3. A great many jobs are build on the persuading function.	3. Conduct small group discussions on persuasion as used by teachers, parents, community leaders, government officials, salesmen and students.	
		4. Repeat group experience (1) having students discuss any new or different perceptions they may have gained from the "persuading" experience.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Speaking - signaling is a form of communication involving the talking with and/or signaling people to convey or exchange information. Includes giving assignments and/or directions to helpers or assistants. (D.O.T.)	1. Because of the noise factor on many jobs, messages must be conveyed through the use of a variety of signals.	1. Have the students relate how the coach gets them to act even though he retains a whistle in his mouth.	See Appendices A and B for occupations that contain the speaking-signaling function (e.g. store dectective, 379.168)
	2. Successful speech often includes giving signals to your listeners or accepting signals from them.	2. Show necessity for clear understanding by passing a "rumor" around the room and comparing the end product to the original statement.	
Signaling can be accomplished by verbal comments, gestures, signs, lights, or sounds. Speaking-signaling functions often require an individual to provide direction, give commands or give warnings.	3. Speaking and signaling often entails a responsibility for the welfare and safety of other people.	3. Discuss how signals are used by students in the school (the turned shoulder, pat on back etc.).	
		4. Students can observe the signaling techniques that each of them use while they talk.	
		5. Have students note how signals are used in their community.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Serving people is a form of communication which involves attending to the needs or requests of people or animals or the expressed or implied wishes of people. Immediate response is involved. (D.O.T.)	1. Serving relies on a person meeting the wishes of another.	1. Have the students describe situations where they have attended to another person in a serving capacity (at home, in the community, at school, on the job).	See Appendices A and B for jobs with serving function (e.g. barber, 330.371).
Serving is very often related to helping other people. The person who serves others usually provides some kind of service - personal, protective, etc. He must accommodate others, very often at his own personal inconvenience.	2. Serving involves following instructions.	2. Discuss instances where students did something for another person even though it was inconvenient for them or against their own feelings. Encourage students to explain how they feel about the serving function. In conclusion, raise the question - Would you like to be in an occupation where serving is the most important function.	
	3. Serving requires that the individual accommodate others regardless of his own feelings.	3. Role play some service occupations. (see list of local service occupations in the Appendix or consult the D.O.T.)	

C. READING

A good portion of the English curriculum is devoted to reading. This type of learning can be directed toward helping students develop skills which have immediate relevance and use. Much of the material in the following section is directed toward using the area of reading in the English curriculum as a means of providing students with experiences which are appropriate to their vocational maturation.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
I. Reading - Locational Skills			
A. Teachers of English have a responsibility to introduce students to a wide variety of reference and resource tools.	1. Various reference books are helpful in educational planning.	1. Help students to identify the location (s) of these books in the school.	1. Comparative Guide to American Colleges, Published by Harper and Row, Evanston, Ill.
There are reference sources in the library and/or guidance office that are valuable to students in educational planning and vocational planning. (see listing in Resources or consult with the school counselor).	2. Some reference books can provide information about jobs and/or work opportunities.	2. Bring selected reference books to the classroom and demonstrate their use (or have students do this).	2. Barron's Guide to 2-Year Colleges, Published by Barrons Inc., 113 Crossways Park Drive, Woodbury, N.Y., 11797.
		3. Have a guidance counselor demonstrate the content and use of the Dictionary of Occupational Titles (Volumes I and II).	3. Lovejoy's Guide to Vocational Schools, Published by Simon and Schuster, Rockefeller Center 630 5th Avenue N.Y., N.Y. 10020
			4. Dictionary of Occupational Titles U. S. Deparment of Labor
			(most of the above materials or similar publications can be found in the school guidance office.)

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
B. Teachers and librarians have a responsibility to teach children how to use a card catalogue and related sources which provide student with information. 1. Author, title, and subject. 2. Working with individuals to find special materials and/or special requests.	1. The ability to readily locate resources is a valuable asset to one's future educational and occupational pursuits.	1a While visiting the library demonstrate to the class how to look up subject pertaining to an occupation (e.g. carpentry, oceanography). b Follow through by taking the class to the book on the shelf. c If information is not available in the card catalogue, ask the librarian for assistance.	See Appendices A and B for list of local occupations that could be used in developing the various techniques suggested. Library Card Catalog, Guidance Files & publications Occupational Outlook Handbook. Dictionary of Occupational Titles Both published by the U.S. Dept. of Labor.
3. Demonstrate other sources for finding information such as the guidance office.	2. There are many sources of information about occupations which a person can read.	2. Arrange to take the class to the guidance office and have the school counselor demonstrate the occupational files and materials available.	
	3. Information about occupations is usually available in the library or the guidance office.	3a Assign members of the class to research an occupation. Occupations can be assigned or printed on slips and drawn randomly. b Have members of the class discuss the possible research techniques they might use in obtaining information about the occupation assigned. Focus on sources for reading.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
C. Teachers have a responsibility to show pupils how to pull out the essential parts of a pamphlet or book. Reading Books: Explanation and understanding of the introduction. Chapter titles, subtitles and highlights of the chapter. Examination of last chapter relating it to the rest of the book. Examination of summary pages for any significant information. Reading Pamphlets: Pamphlets are usually brief yet cover a variety of topics. Pamphlets can be reprinted more economically and therefore often contain more up-to-date information. Pamphlets can be skimmed much as one does a book.	1. Pamphlets and occupational briefs can be used to obtain a great deal of information about an occupation quickly. 2. Pressure for time necessitates skimming vast amounts of materials or seeking shorter versions which provide general coverage of a topic.	Using a job description pamphlet, demonstrate its use to the class. Have the students report important facts concerning an occupation.	Any series of job description pamphlets such as the "Job Family Series." Published by Science Research Associates, Chicago, Illinois

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
II. Reading - Other Sources			
A. English teachers should do everything possible to familiarize pupils with magazines. There are magazines from occupational areas with which pupils should be familiar.	1. Magazines and periodicals are an important source of information for students.	1. Have each pupil select a magazine from a list provided to identify the purpose and type of material published, the frequency of issue and the price. Students should be encouraged to report on all publications even if they are too technical, too difficult or not useful.	Readers' Guide to Periodical Literature The H. W. Wilson, Co. New York
Magazines and technical journals such as: Architectural Record Aviation Week and Technology Bulletin of the Atomic Scientist Farm Journal Modern Photography Organic Gardening and Farming	2. Professional journals are often too difficult for general reading but are very good sources for information of a technical nature. 3. Some professional or technical journals are excellent sources of information that can be useful in accomlishing specific tasks.	2. Oral reports may be given on the various magazines. However, student buzz groups may provide for more participation and exchange of information.	
can be used to acquaint students with the variety of publications from which sources of information of both a general and technical level can be obtained.			
Teachers should secure an annotated list of such publications for use in orienting students to these kinds of reading opportunities.			

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
B. General magazine	1. Title of magazines give clues to their contents.	1. Have the pupils explain how the title of a given magazine could have been derived.	Readers' Guide to Periodical Literature Published by H. W. Wilson Co., N.Y., N.Y.
	2. Different magazines appeal to different types of people.	2. Have the students recommend a list of magazines for each of the following types of people: farmer, businessman, housewife, sportsman, lawyer, etc.	Any other standard list of magazines or periodicals
	3. Some magazines appeal to specific kinds of workers.	3. Assign each student an occupation and explain to the students that they have just been assigned as editor of a publication that will appeal to workers in that occupation. Ask them to create a title for the publication. (e.g. carpenter - Hammer and Saw, fisherman - Rough Waters).	
	4. Some magazines appeal to people with particular interests or skills.	4. Have two or three students construct a bulletin board of magazine covers some of which would include vocationally oriented publications.	
		5. Have the students classify the magazines in the list under general headings such as: household, travel, science, current events, business, occupational, etc.	Readers' Guide to Periodical Literature Published by H. W. Wilson Co., N.Y., N.Y.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		6. Conduct an informal class discussion discussing why certain magazines are classified under certain headings. 7. Using part of a class period, show the class how to find various magazines in the library.	

D. COMPOSITION

Written communication remains a significant activity in all of life and work. In the following section an initial attempt has been made to relate some of the work in composition to present facets of the life of the student, as these can be significant to his vocational development.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
A. Organizing by time and order. Coordinating activities (ie. determining time, place, and sequence of actions based on analysis of data).	Students should be able to plan, arrange, and sequence a series of facts or situations in order to accomplish a task.	1. Begin by presenting the students with the following series of situations instructing them to examine and sequence the situations so that one flows smoothly from the other. (This activity will help the students to see the importance of sequencing as a part of the coordinating function). a. The salesman checked to make sure delivery of the product was made. b. The salesman wrote up the order. c. The salesman introduced himself and the product. d. The salesman received his commission. e. The salesman composed a letter of introduction describing the product. f. The salesman discussed the order with the production manager of his company. g. The salesman discovered that the potential buyer would be able to use the product. h. The salesman wrote a letter of confirmation to the buyer.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		2. Present the class with a problem (e.g. "How would you go about buying a birthday gift for your father?", or "What steps would you take to have a school rule changed?"). a. Instruct the students to sequence the activities that might be involved. Be sure they give attention to time, place, and other considerations essential to the activity. b. Have each student write up a series of statements showing how he would sequence the activities. c. After the various statements of sequence have been written, have the students discuss the different approaches that were used to complete the activity (e.g. some people might have simply gone to the store and looked around until they found a gift, others might have planned and coordinated their activities more carefully, etc.). 3. Relate the coordinating functions to other English classroom tasks such as preparing for and writing a term paper or a book report.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
B. Organizing by classification. Students should be able to gather, collect, and classify information in order to report and/or carry out an activity. It is important for students to be able to compile data.	1. There are many ways a person can obtain information. 2. Not all information is reliable (gossip, rumor, misrepresentation, etc.). 3. In order to make information useful, it must be organized.	1a. Divide the class evenly into 3 or 4 groups. Have each group select a meaningful topic on which they would like to compile information (or the teacher can assign topics if preferred). Suggested topics: Drugs, the "pill", competition, the problems of (a local company), a community issue (e.g. the jet port or a new shopping plaza in a residential area). Topic must be timely and of general interest to the class. b. Instruct the class to compile as much data as possible on the subjects selected. Allow 3 or 4 days for students to do research on their own. Some time should be allowed in class periods for the groups to sit together and discuss their activities. Encourage the students to obtain information by various methods, i.e. interviewing people, research in the library, reading, observing, etc.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		c. Have the students organize and write up the material. Allow some class or small groups for this purpose. d. After the material is written up, have each group present their facts and explain how they compiled their information. e. As a possible concluding activity, present the class with the problem of reporting the data to other people (e.g. parents, school administrators, guidance counselors, community leaders, etc. as might be appropriate). The class may decide to engage in this phase of the compiling function or they may choose to conclude the activity without reporting the data beyond the classroom.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
C. Organizing by comparison and contrast.			
It is important for students to be able to judge the readily observable structural and compositional characteristics of of data, things, and persons. This activity involves the work function comparing.	Comparing involves finding or observing similarities and differences. Comparing also involves noting similarities of many different types: size, shape, environments, behaviors, personalities.	1a. Present the students with two contrasting situations (e.g. the youngster who lives in a big city tenement and the youngster who lives on a small country farm.) The teacher may use pictures, a written description or a reading, to present the situation.	
		b. Have the students write a paragraph in which they discuss all the similarities in the situation presented. Have the students write a second paragraph discussing the differences in the situation.	
		c. Conduct a class discussion having the students point out the kinds of things that were compared (e.g. environments, personalities, behavior, etc.). In this discussion, the teacher should try to emphasize the many different aspects of the situation that were compared or contrasted.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
). Organizing information about oneself			
It is not only important for a student to give some thought about who he is, but it is equally important for him to be able to express this self-identity in either an oral or written form. This activity focuses on the written form. Some of the topics that the teacher may want to include follow:	1. It is (easier, harder) for some people to write about who they are than to talk about it (students will differ in their view of this concept). 2. Some people find it difficult to evaluate their strengths and weaknesses. 3. Employers will expect job applicants to be able to decide and discuss their abilities and interests.	Ask the students to write a resume incorporating the ideas mentioned in the content. Explain that the writing of the resumé can help them to become more aware of information about themselves. Such information can be useful in thinking about present situations or problems, in planning for the future or in seeking a part-time or summer job.	Pamphlets: Discovering Yourself All About You Your Abilities, Science Research Associates, Chicago, Ill. Dictionary of Occupational Titles U. S. Department of Labor
a. Basic facts about the student (e.g. name, age, address, educational background). b. Specific aptitudes and abilities the student possesses (e.g. what the student is capable of doing). c. Specific interests and temperaments - 1. Does the student like working with others or working alone? 2. Does the student like to control and direct others (be in charge) or does he prefer to be controlled and			

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
directed? 3. Does the student prefer working with data, people or things?			

E. LITERATURE

Literature is life. What a host of opportunities are thereby offered the teacher of English to provide students with an opportunity to explore the ideas, feelings and attitudes of many, many people. In the following section, a very basic attempt has been made to help English teachers explore more widely the numerous opportunities they have to use literature in ways that the young adolescent can find meaning for his own growth - and, in particular, his vocational growth.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
A.1. What does "setting" include? It is possible to draw some similarities between the "setting" of a story and the environment of an individual. In this sense, then, it is possible to discuss the setting of a story and the environment of an individual.	A person's environment contributes significantly to the way he behaves, the things he likes to do, the way he feels, etc.	1. Use the setting of any story (or stories) to show how it has influenced the development of the plot, the characters, etc. Provide the students with an opportunity to draw any comparisons to their own existence they may feel appropriate. 2. Set up classroom buzz groups and have each discuss how a change in setting may improve or reshape a person's attitude, feeling, or performance. (It is possible that the use of buzz groups as a classroom activity may provide sufficient environmental change to become the focus of discussion in some groups). 3. Ask the students to identify an occupation and read a piece of occupational literature that describes the work environment of that occupation.	A. Excerpt from Magic Mountain (descriptive passage concerning the desolation of the sanitarium) by Thomas Mann B. Introduction to "Legend of Sleepy Hollow" by Washington Irving

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
A-2. In relation to the literature under study:			
1. Define "mood" and its relation to "setting".	1. Feelings and attitudes are important in setting the tempo of many life activities.	1. Demonstrate how setting and mood may be segregated by reading students a libretto or plot synopsis of West Side Story. Point up the enthusiasm of Tony at finding Maria and the changes in mood as the people in the story change their attitudes. Play the score of West Side Story in class.	1. Story summary or synopsis of West Side Story. Recording of West Side Story score.
2. Distinguish between the "mood" and the "setting". Are these distinct? Always?	2. Feelings among people differ widely even in the same circumstances.	2. Cite a young person's attitude toward life and his environment.	2. Drop Out by Jeanette Eyerly
3. What has determinded the "mood" of the story? What are the attitudes of the people involved in the story?		3. Have students identify a selection of literature that depicts a feeling or a "mood" that has meaning for them.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
B-1. What constitutes a plot.			
Uncovering the plot requires analysis or the examination and evaluating of subjective and objective data.	Analysis is an integral part of many life and work functions.	1. Ask each student to read a short story and to prepare a concise statement relating the plot of the story. 2. Have individuals relate some of the steps they used in analyzing the story in order to identify and combine the ingredients that go into the plot. 3. Discuss the function of analyzing situations and relate these to real life encounters.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
3-2. What constitutes a plot? Define the elements of forces in conflict.	Most phases of life involve problems. Problems may be people oriented or thing oriented.	1. Lecture concerning the importance of conflict in depicting life. Show the obvious situation where a "story" is built without any struggle by selecting a piece of literature such as Johnny Tremain or The Light in the Forest.	Johnny Tremain by Esther Forbes The Light in the Forest by Conrad Richter

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
C-1. Through the use of various types of literature (biography, novels, etc.), the English teacher can help the students to distinguish between the physical and the psychological elements of individual identity (characterization).	A person can rarely, if ever, be characterized on the basis of his physical appearance. People are different People change their own identity.	1. Ask members of the class to read a biography and to prepare a short sketch of the biography to be read to the class. If possible, ask students to locate pictures of the subject to be shown before the sketch is presented. As the picture is shown, class members can offer to characterize the subject. Students should be encouraged to present data showing how the identity of the subject may have changed at various times in his life.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
:-2. What motivates an author? It is something about life he wants to communicate or is it some basic principle or philosophy that he wants to teach his reader? Or is it something else? In any event, many stories do offer the reader many experiences and life insights. The life goals of many characters in many stories can be used as a basis for examining life and opportunities it offers.	1. Goals have a directing influence on one's life. 2. Goals evolve from one's style of life, both of which have a directing influence on one's life. 3. The discovery of the theme of a story engages the reader in the analysis and synthesis of feelings, ideas, or facts.	1. Have students read several stories and identify life or personal goals as these are evident in the characters portrayed. Some goals which might be identified include adventure, money, success, status, esteem, security, etc.	

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MATHEMATICS

and

VOCATIONAL MATURATION

by

Orin Segall

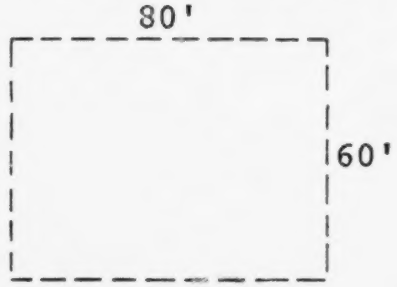
A. INTRODUCTORY STATEMENT

The basic subject concept in mathematics is that symbols may represent known and unknown quantities in the solution of problems. Throughout the study of mathematics, students are called on to synthesize, coordinate, analyze, compile, compute, compare, and copy data. Students must apply principles of a rational system to solve practical problems and deal with a variety of known and unknown variables. They must be able to interpret data and instructions given in written, oral or diagramatic form. In addition to math and reasoning development, general intelligence, verbal, and numerical attitudes are tapped.

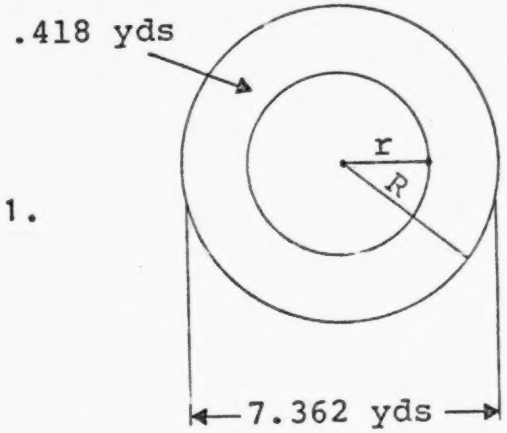
Students who enjoy and succeed in their study of algebra are generally those who prefer situations involving activities of an abstract, creative nature. Although his activity may later be integrated with that of others, the student of algebra generally works alone. Some personal characteristics the student will rely on are curiosity, patience, and initiative.

Geometry involves the ability to coordinate, determine, analyze, synthesize and compute the relationship of points, lines, angles, surfaces and solids. Definitive principles are commonly employed in dealing with the figures and formulas. Geometry is one of the individual's earlier encounters with academic abstractions complicated by a new vocabulary and terms. A number of human abilities are being tapped: visualization, form perception and abstract reasoning.

As in all human learning, communication between the teacher and the student is an important factor. Self-realization also remains an important objective. The study of mathematics, as it is initiated during these middle school years, can provide for self assessment in several areas that may have been unrecognized in the earlier years of the educative process. The concepts which follow have been developed with these potential contributions to the vocational maturation of the individual in mind.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
I. Arithmetic, Algebra, Geometry			
A. Basic Processes	A. General Concepts 1. Basic arithmetic processes are essential to everyday living. 2. The basic arithmetic processes involve simple addition, subtraction, multiplication and division. 3. Most work requires skill in performing the basic arithmetical processes. 4. Numbers and letters are used in working with people, data or things. 5. The study of algebra requires the application of principles of logical or scientific thinking often involving symbolism and/or abstract thinking. 6. The ability to perform algebraic procedures in standard, practical application represents a higher level of mathmatical development. Such a level of general educational development is required in a great many jobs.	Assignment: A carpenter has been hired to build a post and rail fence. If a post is placed every 10' on a 60' x 80' lot, how many fence posts must he buy? If they cost $3.50 each how much will they cost in all?  Solution: arithmetic 28 x 3.50 - 98.00 (number of posts)(cost per post) $T = N(C)$ $T = \frac{2(1 + w)}{10} \frac{(7)}{(2)}$ $T = \frac{2(80 + 60)}{10} \frac{(7)}{(2)}$ $T = 98$	**Film** "Preparing for the World of Work", Guidance catalog Vol. 9, Guidance Associates. "Careers in the Building Trades", Coronet **Filmstrips** "The Information Machine", IBM "Let's Look at Careers", Essential Education.

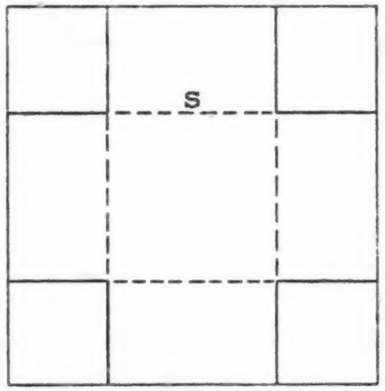
CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
B. Definitions Numerical: Ability to perform arithmetic operations quickly and accurately. (D.O.T., Volume II, p. 653)	B. Conceptsrelated to abilities and aptitudes		
	1. Numerical ability is helpful in performing arithmetical operations quickly and accurately.	1. Have students cut 15 x 15, 18 x 18, and 21 x 21 squares. At $9.00 per square yard, what would it cost to carpet a 15' x 15' room? $\frac{15 \times 15}{9}(9) = 225$ $\frac{15^2}{9}(9) = 225$ $\frac{(a + b)^2}{9}(9) = 225$ $\frac{a^2 + 2ab + b^2}{9}(9) = 225$ Have students repeat problem with other squares until the arithmetic and algebraic relationship of squaring a number is established.	"Algebra Can Be Fun!" William A. Ransone, J. Weston Walch, Publisher, Portland, Maine "A Demonstration Coure", TMI - Grolier - James L. Evans. "Gimmicks", Edited by R. O'Neil, Central Iowa Mathematics Project, CILAMP, 1350 E. Washington Avenue, Des Moines, Iowa 50316. "The Modern Computing Abacus", Elda L. Merton, Ideal School Supply Co. "Modular Systems", Edward J. Zoll, The Macmillan Company, New York.
	2. Finger and manual dexterity are required in many occupations where basic arithmetical operations are performed. (cashier, bookkeeper, etc.)	2. Have students make an abacus and manipulate beads as in decimal system. Bring in cash register and show how the basic arithmetic operations of the abacus are used in the cash register.	"Bases and Numerals", Morton Seltzer, The Macmillan Company, New York, New York.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
C. Form perception: Ability to perceive pertinent detail in objects or in pictorial or graphic material; to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines. (D.O.T., Volume II, p. 653)	C. Form perception is a helpful aptitude in working with numbers. 1. Arithmetical processes or operations involving numbers require that an individual be able to make very fine comparisons and discriminations with his eye.	1.  At \$2.00 a square yard, what would it cost to tile a walk around the circular swimming pool? Develop original formula: $TC = \pi R^2 - \pi r^2)\ (2)$ Total cost - $2\pi(R^2 - r^2)$ Where $R = 3.681$ $r = 3.2$	"Elementary Algebra", Barnett Rich, Schaum Publishing Company, New York. "Mathematics for All High School Youth", Bureau of Secondary Curriculum, State Education Department, Albany, New York. Film "Areas", 12 minute sound, Knowledge Builders, Floral Park, New York.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
D. Clerical perception: Ability to perceive pertinent detail in verbal or tabular material; to observe differences in copy, to proofread words or numbers, and to avoid perceptual errors in arithmetical computations. (D.O.T., Vol. II, p. 653.)	D. Speed and accuracy are often associated with an individual's ability to detect numerical details in copying or manipulating numbers.	D. This quiz stresses rapid mental calculation. The goal is to increase awareness of mathematical relationships and understanding of number pattern. Time: 5 minutes - with practice 3 minutes. 1. 4.13 ÷ 1000 = 2. 75(48) = 3. $(4.001)^2$ = 4. 67(73) = 5. 56(99) = 6. .125(88) = 7. 5.3 ÷ .01 = 8. $(4.5)^2$ = 9. 28 ÷ .875 = 10. 15(24) = 11. 56(372) + 44(372) = 12. 2% of 350 = 13. 14(16) = 14. 2.10 - 1.65 = 15. 25(72) =	"The Math Wizard", Louis Grant Brandes, J. Weston Walch, Publisher, Portland, Maine. "Factors and Primes", Morton Seltzer, The Macmillan Company, New York. "Number Sentences", Vernon L. Dausch, The Macmillan Company, New York. "Factoring", Anderson, Ramsey, and Linn, Central Iowa Mathematics Project, 1350 E. Washington Avenue, Des Moines, Iowa 50316. "Decimals", Williams, Lewis, and O'Neil, Central Iowa Mathematics Project, 1350 E. Washington Avenue, Des Moines, Iowa 50316. "Rational Numbers", Breeding, Hamm, and Lutz, Central Iowa Mathematics Project Avenue, Des Moines, Iowa 50316.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		16. $(41)^2 =$ 17. $(6.02)^2 =$ 18. 2 1/3% of 900 = 19. $(2.5)^2 =$ 20. .001(51.4) = 21. 2 1/3 of 900 = 22. $15 + 3 \times 10 - 30 \div 5 =$ Learnings to be derived from problems above are: 1. Reciprocal function 2. Associative Law $75 \times \frac{100}{100} \times 48 = \frac{75}{100} \times$ $48 \times 100 = \frac{3}{4}(4800) = 3600$ 3. $(a + b)^2 = a^2 + 2ab + b^2$ 4. $(a-b)(a+b) = a^2 - b^2$ 5. Distributive Law $100(56) - 1(56) = 99(56)$ 6. Decimals to fractions $\frac{1}{8}(88) =$	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		8. Squaring two digit numbers ending in 5 9. Decimals to fractions; reciprocals 10. Distributive Law $10(24) + 5(24) = 15(24)$ 12. % to a fraction - $\frac{1}{50}(350)$ 14. $1.65 + \Delta = 2.10$ 18. $\frac{7}{300}(900) =$ 21. Discriminate between problem 18 and 21 -- $\frac{7}{3}(900) =$ 22. Order of operations At first or second try, student will probably use pencil and paper. Teacher should stress mental calculation based upon arithmetic and/or algebraic concept involved.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
E. Spatial: Ability to comprehend forms in space and understand relationships of plane and solid objects (ability to visualize objects in two or three dimensions or think visually of geometric forms). (D.O.T., Volume II, p. 653)	E. Algebra requires a high level of general learning ability and the ability to perform arithmetic operations quickly and accurately.	E. Have students construct a box from a square piece of cardboard, cutting from each corner a square 3" on a side. The sides of the box are to be formed by turning up the four equal rectangles as shown. What value must s have, if the volume of the box is to be 75 cu. in.? 95 cu. in?  $V = s^2h$ $95 = 3s^2$ $31.67 = s^2$ $+\sqrt{31.67} = s$ $V = s^2h$ $75 = 3s^2$ $25 = s^2$ $5 = s$	"Geometry and You", 10 minute sound, Coronet Films, Educational Film Library, Syracuse University.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
F. Situations involving the evaluation of information against measurable or verifiable data.	F. Concepts related to work situations. 1. Work situations that require the constant use of basic arithmetical processes are often repetitive or short cycle operations that are carried out according to set procedures.	1. Organize a fund raising activity involving some item for profit. Lead student into arithmetic problems that the store owner might have to solve. Set up simulated: a. Store situation - use of cash register: Ringing up sales Making change Ex: a. Take away method of subtraction b. Additive method of subtraction in making change.	"How to Express Yourself Vocationally", American Personnel and Guidance Association. "Making Mathematics Plain", Rose and Ruth Weber, McCormick - Mathers Publishing Company, Inc. Cincinnati, Ohio 45102.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
G. Situations involving the precise attainment of set limits, tolerances, or standards.	G. Many work situations require an individual to be able to apply mathematical and statistical techniques.	G. Record heights of each student in class in a table. Develop meanings of terms: a. array b. class interval c. frequency table d. average: simple, weighted e. mean f. median g. mode Students should make a picture of a frequency polygon.	"Graphs and Statistics", Bureau of Secondary Curriculum Development, The New York State Education Department.
H. Situations involving working along and apart in physical isolation of others although the activity may be integrated with that of others.	H. Situations in which complex or theoretical mathematical concepts are involved often require an individual to work alone or apart from others for a great deal of the time.	H. Take class on field trip to IBM, NCR, GE or computer center at local University after involving them in a study of numeration, particularly binary, octal and duodecimal systems.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
I. Definition Computing: Performing arithmetical operations and reporting on and/or carrying out a prescribed action in relation to them. (D.O.T., Vol. II, p. 649). Compiling: Gathering, collating or classifying information and reporting or carrying out a prescribed action in relation to the information. Copying: Transcribing, entering or posting data.	I. Concepts related to work functions. 1. Basic arithmetic processes involves using and manipulating data in the form of number, words or symbols. 2. The work function computing draws heavily on basic arithmatical processes. 3. Some computing occupations require that an individual be able to operate a particular machine. 4. The work function compiling often combines arithmetical operations (computations) with clerical skills and procedures. 5. The work function copying involves being able to copy numbers or use number processes in such activities as sorting, inspecting or measuring.	Take class to local brokerage house and familiarize students with vocabulary, technology and purpose. Play "Stocks and Bonds" by organizing class into groups of eight.	Game: Stocks and Bonds, 3M Company, St. Paul, Minn.

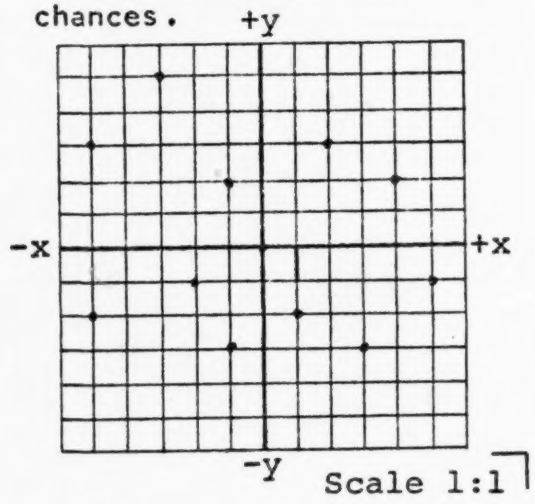
CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	2. Work situations in mathematics often require the individual to attend to very specific information (detail) or to follow very definite instructions.	2. Discuss: What services are offered by your local bank?	
		a. Saving Plan - Plan for the future. Deposit a sum of money in your savings accound and show how interest can be compounded daily, monthly, and semi-annually.	
		b. Checking Account - Show the use of the reconciliation statement. Show how it can give you valuable information in balancing your checking account.	"The Story of Checks", Federal Reserve Bank of New York.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	2. Activities involving higher level mathematical processes and concepts are often preferred by people who prefer to work with data or things rather than with people.	2. Demonstrate to students the use of FORTRAN, and machine language as an aid to problem solving.	"Algorithms, Computation and Mathematics", (Fortran Supplement), SMSG, Yale University, New Haven, Connecticut.
	3. Higher level mathematics often requires the individual to be able to apply his findings to solving problem situations or to create new knowledge.	3. Hand on experience in use of computers, making data cards, etc. at computing center.	"A General Purpose Translation Demonstrator", John D. Sybalsky, a paper delivered at the 21st National Conference of the Association for Computing Machinery, August 30 - September 1, 1966.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	J. Concepts related to consumer mathematics.		
	1. Basic arithmetic processes are used daily in conducting one's own personal affairs.	1. Ask students to bring to class for fact finding the following: a. want ads b. furnishings ads c. building supplies ads d. sporting goods ads e. mileage maps f. phone directories g. yellow page h. train schedules i. movie time table j. used car sale ads k. real estate ads l. tools, motor, machine ads m. business opportunities ads	1. "Occupational Education Fact Finding Series", Part I, II, and III, Special Service Supply, Box 705, Huntington, New York 11743.
	2. Increasingly one has to be able to perform the basic arithmetic processes in order to meet a variety of personal or family responsibilities (budgeting, banking, consumer buying, income tax).	2. Discuss and become familiar with the vocabulary of a variety and nature of forms including: a. mortgage loan b. life insurance c. motor vehicle d. banking e. credit card f. savings bank g. social security h. pay check Practice filling these out.	2. "Fundamental Forms Skill Text For Everyday Living", Special Service Supply, Box 705, Huntington, New York 11743.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		3. Develop a family budget with class participation: Provide for: 1. Food 2. Shelter 3. Clothing 4. Operating expenses 5. Advancement	3. "Arithmetic Skill Text for Daily Living", Part (A), (B), (C), Special Service Supply Box 705, Huntington, New York 11743.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
II. Graphs and Statistics			
A. Some information is well suited to graph presentation. In business, graphs are often used to illustrate and analyze fluctuation in profits, losses, production and competition. Statistics are often used to make decisions and show relationships in the business world.	A. General Concepts 1. The use of graphs and statistics require the application of common sense to carry out instructions furnished in written, oral, or diagramtic form and the making of arithmetic calculations involving fractions, decimals and percentages.	1. Have students bring in graphs clipped from newspapers or business magazines. Using an overhead projector, discuss: a. line graph including curves b. bar graph c. circle graph d. pictograph e. composit bar f. scatter diagrams Take class to a local hospital where they might view graphs. a. charts of patients blood pressures b. recording temperatures of patients c. the cardiogram d. use of the oscilliscope in taking an EEG, or EMG	"Graphs and Statistics", Bureau of Secondary Curriculum Development, New York State Education Department, Albany, New York. "Roadways of Industry", National Industrial Conference Board.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
B. Definition: Clerical perception: Ability to perceive pertinent detail in verbal or tabular material - to observe difference in copy, to avoid perceptional errors in arithmetic. (D.O.T., Volume II, p. 653).	B. Concepts related to abilities and aptitudes. 1. Clerical perception is an aptitude that can be readily utilized in dealing with certain skills and tasks of a numerical nature.	1. Have students draw a bar graph showing % of world's car production in 1962, as derived from raw statistics in resource. By means of a line graph, have students plot hourly temperature changes from 9:00 a.m. - 3:00 p.m. Encourage students to record % of change, to nearest tenth of a percent, from day to day at same hour. In order to familiarize students with graphing of algebraic equations, introduce game of "Battelship". Class can play in groups of two. Object of game: to "sink" all enemy ships by correctly finding them on a grid. Players alternate after having had five chances.  Scale 1:1	"Facts for Study", Educational Services, Automobile Manufacturers Association, 320 New Center Building, Detroit, Michigan, 48202.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	E. Concepts related to consumer mathematics.		
	1. Graphs and statistics are important in handling one's personal affairs.	1. Graph price changes over an extended period of time by using line and bar graphs.	"Occupational Monographs June 1971", Mid-Hudson Career Development and Information Center, Beacon, New York, 12508.
	2. People often analyze the factors involved in making a purchase from among several choices.	2. Making Statistical Comparisons: a. Unemployment figures as provided by the Department of Labor from month to month. b. Wages earned in specific jobs in the local area over a period of time.	
	3. Graphs help people to understand quickly data that is often complex.	3. Encourage students to budget a monthly income of $440. Devise table (scatter) and make circle graph from table. When buying a home alternative financing methods are available. Have students calculate and graph the expenditure of money in paying off a loan of $16,000, at 6%, over a twenty-five year period, as opposed to making a down payment of $6,000, and taking a $10,000 loan at 6% for a twenty year period.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		Learnings to be derived: a. origin b. x,y axes c. abscissa,ordinate d. co-ordinates of a point e. scales f. ±x, ±y axes g. quadrant	

<table>
<tr><th>CONTENT</th><th>CONCEPTS</th><th>TECHNIQUES</th><th>RESOURCES</th></tr>
<tr>
<td>Analyzing: Examining and evaluating data.</td>
<td>2. The synthesizing, coordinating and analyzing work functions are higher level operations usually requiring more statistical skill and comprehension.</td>
<td>a. $D_1 = 25x - 2x^2$

<table>
<tr><th>X</th><th>0</th><th>2</th><th>4</th><th>6</th><th>8</th><th>10</th><th>12</th></tr>
<tr><td>D_1</td><td>0</td><td>42</td><td>68</td><td>78</td><td>72</td><td>50</td><td>12</td></tr>
</table>

$D_2 = 5X$

<table>
<tr><th>X</th><th>0</th><th>2</th><th>4</th><th>6</th><th>8</th><th>10</th><th>12</th></tr>
<tr><td>D_2</td><td>0</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td></tr>
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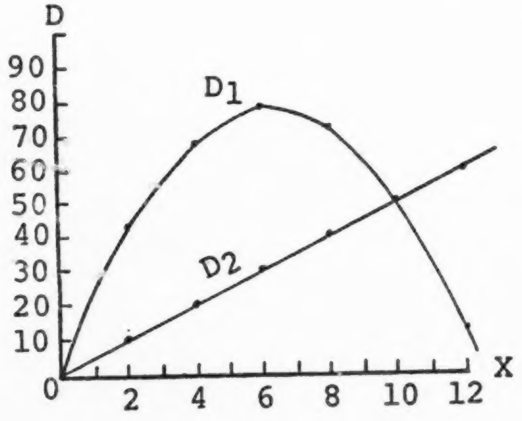


b. $D_1 = D_2$

$25X - 2x^2 = 5X$
$2X^2 - 20X = 0$
$x^2 - 10X = 0$
$X(X-10) = 0$
$X = 0 \quad X = 10$

$D_2 = 50$ mi $D_1 = 50$ mi</td>
<td>"Modern Mathematics Introductory Concepts and Their Implications", A. B. Evenson, Scott, Foresman and Company, Fairlawn, New Jersey.
Film
"Algebra in Everyday Life", 10 minute sound, Coronet Education Film Library, Syracuse University.</td>
</tr>
</table>

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
III. Measurement	A. General concepts		
	1. Measurement involves examining, measuring, or weighing objects or materials.	1. Take class to home economics room and have girls demonstrate the examination, measuring, and weighing of ingredients when baking a cake.	Clark, Frank "Contemporary Math". Franklin Watts, Inc., 575 Lexington Avenue, New York, New York Adler, Irving "The Giant Golden Book of Mathematics", Golden Press Inc., Rockefeller Center, New York, New York.
	2. Measurement often involves the use of devices or equipment such as calipers, micrometers and rulers and gauges.	2. Examine the following industrial arts class. Discuss the scale of: a. Steel tape b. meter stick c. inside and outside calipers d. dividers e. squares f. ruler g. compass h. micrometer i. triangle	Fervavolo, Rocco "Wonders of Mathematics", Dodd, Mead & Company, New York, New York 1963. "Let's Measure Distance, Height, and Time", Vol. 51, No. 3, Cornell Rural School Leaflet. "You'll Need Math", The American Mathematical Association.
	3. The primary senses are used in activities where measurement is involved.	3. Make a model Farenheit thermometer and also a slide rule for use in science and math classes. 4. Have students devise a technique to determine the thickness of a piece of paper. 5. Have students determine the number of paper clips in a bag without counting them. Have a scale at the students' disposal. Hint: Ask the student to weigh one paper clip.	"Measurement", Linn and Ramsey, Central Iowa Mathematics Project, 1350 East Washington Avenue, Des Moines, Iowa, -50316.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		Analyze local school budget using bar and line graphs. Note dollar change and % change from year to year. Divide class into groups to survey the localschool district for census, land usage, true value, appraised value, for purpose of tax revenue projection.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
B. Spatial: Ability to comprehend forms in space and understand relationships of plane and solid objects. Ability to "visualize" objects of two or three demensions.	B. Concepts related to abilities and aptitudes.		"Points, Lines, and Planes", Ernest R. Ranucci, The Macmillan Company, New York.
Form Perception: Ability to perceive detail in objects or in pictorial or graphic material, to make visual comparisons and to see slight differences in shapes and shadings of figures and widths and length of lines. (D.O.T., Vol. II, p. 653).	1. Measuring and related work activities require spatial and form perception abilities. These abilities are particulary helpful in work of a sorting and inspecting nature where it is necessary to perceive differences in tangible matter.	1. Build to scale a farm complex, including silos, house, round swimming pool. Relate plane figures to three-dimensional features of the complex and vice-versa.	"Activities with Ratio and Proportion", Stuart A. Choate, Oakland County Mathematics Project, 2100 Pontiac Lake Road, Pontiac Michigan 48054. "Ratio and Proportion", Madison and Ramsey Central Iowa Mathematics Project, 1350 East Washington Avenue, Des Moines, Iowa, 50316.
	C. Concepts related to work situations.	1. a. points scored in a game	
	1. Many tasks of a measuring nature are routine and repetitive.	b. temperatures for determining clothes to be worn c. balancing one's check book d. cooking e. scheduling f. telling time	
	2. Measuring tasks require worker accuracy and attention to detail	2. Have class take a traditional school schedule and make a new one providing flexible modular scheduling.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
D.	D. Concepts related to work function.		
1. Compiling: Gathering collecting, or classifying information about data, people or things.	1. Many occupations require the ability to measure things accurately.	1. Take a trip to a fruit growing farm. Grading, sorting, counting, weighing, shipping etc. involve a great deal of work in mathematical operations.	"Where is the Point?", Terrence G. Coburn, Oakland County Mathematics Project, 2100 Pontiac Lake Road, Pontiac, Michigan 48054.
2. Computing: Performing arithmetic operations and reporting on and/or carrying out a prescribed action in relation to them.	2. Work functions which are involved in measurement are compiling, computing, and comparing.	2. Using a map of your locality determine the bearing and distance to various other cities. Work with protractor, and ruler.	"Exploring Linear Measure", Philip L. Cox, Oakland County Mathematics Project, 2100 Pontiac Lake Road, Pontiac, Michigan 48054.
3. Comparing: Judging the readily observable functional, structural, or compositional characteristics of data, people or things.	3. Workers are often required to observe (measure) the size, shape, or structure of objects and to compare these objects (as in an inspecting or sorting job).	3. Use scale drawings of homes to illustrate similarity with real homes.	"Similarity and Congruence", Daniel L. Herman, Oakland County Mathematics Project, 2100 Pontiac Lake Road, Pontiac, Michigan 48054.
	4. Workers are often required to measure objects and often these must be very precise and accurate (computing)	4. Take a field trip to the local post office where mail is brought in by collectors to be sorted, sized and faced for cancellation.	"Angle Measure", Terrence G. Coburn and Philip L. Cox, Oakland County Mathematics Project, 2100 Pontiac Lake Road, Pontiac, Michigan 48054.
	5. Workers are often required to collect, classify or sort records, forms or reports (compiling).	5. An airline pilot must solve track and speed problems. His plane is flying at an air speed of 440 mph, heading 160°; wind 30 mph from 250°. Find direction of the track and the ground speed.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	E. Concepts related to consumer mathematics.		
	1. Most articles that we purchase are sold by some unit of measure.	1. Local supermarket visit can reveal inspecting, sizing, sorting operations especially in canned goods, cereals, etc. Develop the concept of unit pricing, loss leaders, gross and net profit.	
	2. Many of regular day to day activities involve measuring or one of the work functions associated with it.	2. Mr. John bought home insurance pegged at two-thirds its value of $16,500. The yearly rate was 48¢ per $100. What was the annual premium for a 3 year policy? (the 3 year rate is 2.5 times the annual rate).	

WITH A VIEW TOWARD VOCATIONAL MATURATION

--Some suggestions for
physical and life science units
in the
junior high school--

PREPARED BY:
MICHAEL FRISCHMAN
ERNEST PETTINE

INTRODUCTION

The material in this section does not attempt to provide the teacher with a guide to accompany the entire Junior High School Science Curriculum. Instead, some leading ideas are suggested for several units in junior high school science. It is hoped that these suggestions will lead to the development of other "work world" oriented units of study.

Statements appearing in the "content" column are taken from conventional curricula. The "concepts" column provides ideas which are pertinent to an individual's vocational maturation and which the "techniques" suggested will make clear to, and reinforce for, the student. We realize that the vast majority of science teachers have little knowledge of the vocational maturation process. Therefore, we have tried to be as explicit as possible. Our purpose has been to provide the teacher with examples of vocationally oriented planning in the hope that we may better equip our students to deal with the decision-making aspects of vocational choices.

These are suggestions. Teachers who feel that they have more appropriate or innovative techniques for exposing students to situations involving self-evaluation and/or vocational maturation should try them out. Teachers who feel they have been successful are invited to send their recommendations to the authors of this section, or to the Mid-Hudson Career Development and Information Center.

These materials are designed to contribute to the vocational maturation of all students. In this sense then, the teacher of science is a teacher of individuals with certain responsibilities for their growth and development -- vocationally as well as academically or socially.

We hope that these materials will help teachers of science to meet these responsibilities. Even more importantly, we hope they will trigger new and even more creative ideas.

PART I:

PHYSICAL SCIENCE

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
A. Safety in the Laboratory			
1. The objective of safety procedures is to prevent accidents.	1. Safety procedures are a factor in working conditions in industry.	1. Discuss safety procedures in the school lab. What is the purpose of each procedure? What may be the result of violating each procedure?	Posters & films available from National Safety Council Florio, A.E., G.T. Stafford, Safety Education, second ed. McGraw-Hill Book Co., Inc. New York, 1962
2. Violating a safety procedure can endanger the well-being of a person.	2. Safety procedures are often violated in the interest of time or production in industrial settings as well as in the science lab.	2. Have students ask parents what safety procedures they are required to follow on the job. Students will prepare a list of these procedures and be prepared to discuss the purpose of each procedure (as in No. 1 above) in class.	
	3. Certain jobs place a worker in a setting in which he is more likely to be uncomfortable or injured. Factors affecting this are: temperature changes, noise and vibration, fumes, odors, toxic conditions, dust, corrosive substances, moving machinery, flamable substances.	3. Arrange a field trip to a local factory to interview the safety officer and to observe various safety procedures in plant operation.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
B. Mechanics (forces & motion)			
1. There are many definitions of "work."	1. Workers are often required to set up, operate, control, drive and manipulate simple machines to accomplish various tasks.	1. Discuss the several definitions of work Stress two: Physical (w=fxd) and sociological (occupation)	Science Research Assoc. Jobs in Technical Work Pamphlet #4, Job Family Series, SRA, Chicago, Ill. 1964 Science Research Assoc. Jobs in Engineering Pamphlet #7 Job Family Series, SRA , Chicago, Ill. 1964
2. While the amount of physical work is constant for a particular task -- (w=fxd), simple machines can make the job easier for us. Simple machines like pulleys & levers are used everyday in industry.	2. Some tasks could not be accomplished without machines. Machines have extended man's physical abilities.	2. Have students set up pulley systems, levers of different classes, inclined planes, etc. and use them in lab investigations of mechanical advantage and efficiency. Follow this activity with a discussion of what skills, aptitudes, interests and physical abilities were tapped in working with simple machines.	
	3. Various work functions are accomplished when a man sets in motion and controls a machine, tool, or other piece of equipment.	3. Discussion: Will the machine ever replace the worker? In what jobs have men been replaced by machines? What jobs for men have been created by machines?	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	4. A man works with forces and motion when he performs various work functions while working with things. Some of these functions are: a. setting up b. precision working c. operating-controlling d. manipulating e. tending f. feeding -- offbearing g. handling 5. Machines have been accused of depersonalizing working conditions.		

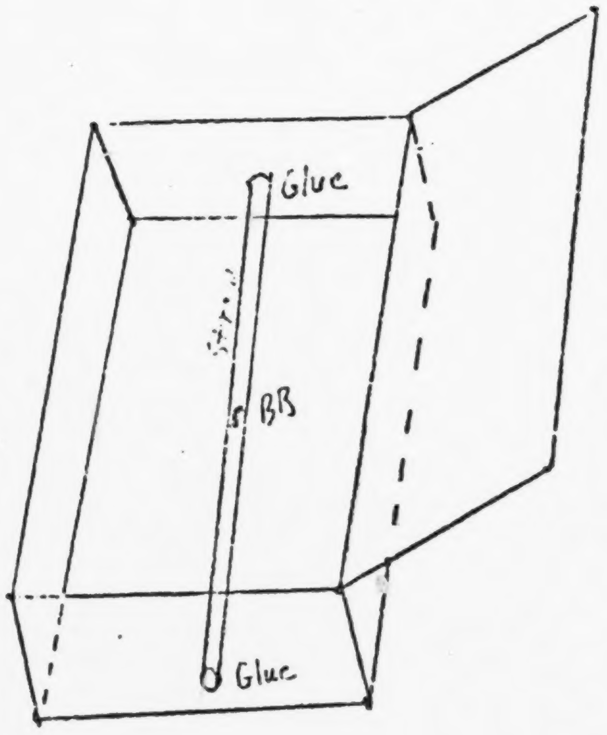
CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
C. Earth Science			
1. A mineral is a naturally occuring inorganic solid, with a fixed internal (atomic) structure.	1. The economic geologist is both scientist and business man. He must analyze, synthesize, compile, and coordinate data of both a scientific and economic nature.	1. Discussion: Use the following questions to stimulate discussion: What is a resource? What is a natural resource? What is a human resource? What industries depend on natural resources? What industries depend on human resources? Would you rather work with people or objects?	Boyd, Waldo T. "Your Careers in Oceanology" Simon Schuster, Inc. 1 West 39th St., New York, N.Y. 10013 1968 Occupational Outlook Handbook Published by the U.S. Dept. of Labor Bureau of Labor Statistics Careers, Inc. Largo, Florida 33540 Oceanographer, Summary No. S-187 Gamow, George "Matter, Earth and Sky" Prentice-Hall, Inc. Englewood Cliffs, N.J. 1965
2. A rock is a portion of the earth's crust. It is composed of one or more minerals.	2. To identify a rock or mineral, several work functions are employed. Some of these are: a) evaluating data obtained by examination of observable physical properties b) judging compositional characteristics c) comprehending forms in space (cleavage, crystal forms)	2. Most earth science instruction includes several lessons on physical properties and identification of rocks and minerals, followed by a lab activity in which students identify "unknown" hand specimens. The teacher should precede this lab with a discussion of the work functions outlined in "concepts"	Weitz, Joseph L. Your Future in Geology Richards Rosen Press New York, N.Y. 10010 1966

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	2. (cont'd.) d) perceiving pertinent detail in objects e) visual comparisons to see slight differences in form or shape f) using finger dexterity g) making color discrimination	2. (cont'd.) (statement #2) writing the statements on the board. Have students determine in what way these functions will be employed in their identification exercise. During and following the identification processes, discuss difficulties and successes with as many individual students as possible emphasizing these in relation to the various work functions performed.	
3. Many industries depend on economic geologists and mineralogists to find natural resources.	3. The geologist is likely to be a man who prefers working in a non-social setting with things or objects in an abstract or creative way.		
4. In studying the earth's crust, rocks and minerals must be identified.			
5. Rocks and minerals are classified and identified on the basis of their observable physical properties.			

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
D. Meteorology			
1. Meterology is the study of the temporary conditions of the atmosphere known as weather. As can be seen from the wide variety of work functions, skills and aptitudes involved in constructing and operating a weather station, this is an extremely valuable undertaking both in terms of vocational maturation and the study of meterology. The project itself should be approached as an opportunity for students to evaluate themselves in terms of their own vocational maturation. Stress the difference in skills, aptitudes, and work functions employed in construction and operation of the station.	1. Constructing weather instruments and a weather station involves many work functions. Some of these are: a. Setting up machines such as table saw, drill press, miter box b. Precision working, particularly as regards to measurement and selection of proper tool and material. c. Exercise of judgment in suiting the tool to the task. d. Operating and controlling power and hand tools e. Manipulating materials f. Handling special devices to work materials	1 a. Give each student the opportunity to choose the task he wishes to perform in the project. After choices have been made, form groups to discuss ways of carrying out their choices. After the project is over, ask the students to reflect on how well suited they were to the various tasks they performed. Students should be free to evaluate each other's performance of assigned or chosen tasks. b. Discuss how the various work functions relate to the world of work.	UNESCO Source Book for Science Teaching Published by United Nations, 1967 pp 92-97: Experiments and Materials for the Study of Weather: "Making weather instruments and a weather station" Berry, F.A. & Frank, Sidney R. Your Future in Meteorology Richards Rosen Press N.Y., N.Y. 1062 Meteorologist Summary No. S-84, 1969 Careers, Inc., Largo, Florida 33540

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		1 (cont'd.) c. Ask students to identify some occupations in which they would be required to tap the skills, aptitudes, and work functions for which they feel they are best suited.	
. The meteorologist is a scientist who studies the weather.	2. Operating a weather station requires a variety of different work functions, skills and aptitudes. Some of these are: a) compiling, comparing, coordinating, analyzing, synthesizing, computing, and posting of data. b) ability to apply principles of logical thinking to define problems, collect data, establish facts c) ability to deal with concrete and abstract variables d) ability to perform ordinary		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	2. d) (cont'd.) arithmetic, algebraic, and geometric procedures in practical situations e) aptitudes: general intelligence, verbal, numerical and clerical perception f) temperament suited to situations involving a variety of duties often characterized by frequent change and short cycle operations carried out according to set procedures. Also, situations involving the evaluation of data against both judgmental and measurable criteria.		
3. Weather conditions affect many phases of our daily lives. Understanding the weather can be interesting and gratifying.			

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
E. Chemistry of Matter			
1. The atom's size is incomprehensible. To study the atom and explain its properties, scientists have developed models.	1. Many scientists must develop or understand models.	1. Conduct the following experiment: The teacher will prepare a cigar box with a soda straw glued along one axis inside the box. Inside the straw is a B-B. This box will produce a clicking sound when it is shaken along the axis of of the straw as the B-B rolls back and forth. The box can be shaken along its remaining 2 axes and no sound will occur. (See diagram right.)	Film: Jobs in Atomic Engergy - U.S. Atomic Energy Commission Pollack, Philip - Careers and Opportunities in Chemistry, E. P. Dutton & Company, Inc. New York 1966. Thompson, William E. Jr. "Nuclear Energy Fields" Richards Rosen Press, Inc., New York, N.Y.
		Seal the box and demonstrate its properties to the class. Have students suggest models which explain the properties of the box. Test these models and discuss.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		This activity will test the student's ability to work in the conceptual realm. It should provide a basis for him to evaluate himself in this respect. Students can be given an additional opportunity to evaluate their conceptual skills as well as their eye-hand coordination and manipulative skills by asking them to construct "mystery boxes" of their own design to be examined by the class.	
2. A scientific model is a physical, mathematical, or verbal construction which explains the properties or functioning of an unobservable process or object.	2. Scientists are often concerned with the abstract rather than the concrete.		
3. The scientific model is indispensible to the nuclear scientist.	3. People who work with or develop sophisticated models must have a high degree of reasoning, mathematical, and language development. Many years of schooling are required to prepare them for their jobs.		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	4. Constructing models is often a way of making abstract ideas more concrete.		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
F. Astronomy			
1. Curious men have always looked to the heavens. The "Space Age" has been built on information gathered throughout man's history. Essentially, however, a great deal of this information has been of very recent origin.	1. America's space program has opened thousands of jobs in aerospace. Many jobs which have never existed before have been invented to fulfill the goal of "Man in Space."	1. Discussion questions: a. "An inquisitive mind with an eye toward detail has been the basis of research throughout the ages." Do you agree with this statement? b. What is "research"? c. What is "curiosity"? Are you curious?	Moore, Patrick The Amateur Astonomer Norton, 1957 Sidgwick, J.B. Observational Astronomy For Amateurs MacMillan, 1955 Adams, Carsbiec Career in Astronautics & Rocketry McGraw, 1962
2. A curious mind with an eye toward detail has been the basis of scientific research.	2. Researchers in all fields have a high degree of intellectual development and many years of schooling have helped qualify them for their jobs.	2. Have the class discuss the following: What temperaments do you think would be necessary to spend 16 days in a space capsule alone? With two other men?	
	3. Research scientists are at home with concepts of an abstract nature. They often work out problems on their own, using higher mathematics as a tool in their investigations.	3. Conduct the following activity: Have each student develop an argument that will convince the class that the earth is round. Instruct students that they may do it at home and use other	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		resources but that it must be their own thinking. Discuss this assignment in class with a view toward helping students to express their feelings about solving this problem, doing research and presenting their findings for others to evaluate.	
	4. An astronaut is a man with a highly specialized job. He is responsible for the accurate performance of a wide variety of work functions.		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
G. Light Energy			
1. Proper illumination is necessary to perform everyday tasks.	1. Illumination is an important part of the work environment. Adequate illumination is essential for the performance of many tasks.	1. Have students perform a variety of the following tasks first with the classroom well illuminated, then in the dark. Some tasks may be reversal-first in the dark, then with well lighted conditions. Tasks might include a needle, measuring exact quantities of water, counting marbles, solving a math problem, reading an eye chart, distinguishing color cards. Follow these activities with a discussion of individuals/groups experiences.	
2. We say we "see" when light stimulates the eyes and brain interprets these stimuli. Note: this material may be used also under Life Science, The Human Body-Perception.	2. Seeing is a physical requirement for most jobs. Seeing involves being able to obtain impressions of size, shape, distance, motion, intensity, and color of objects or light sources. Most jobs require some or all of these abilities.	2. Write "concepts" statement #2 on the board. Discuss how these abilities are used in the classroom, at home, walking to school.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
3. Artificial light sources have extended man's capabilities.	3. The importance of various visual functions varies from job to job. The major visual functions are: a. acuity, far and near b. depth perception c. field of vision d. accomodation (adjustment of the lens of the eye to bring an object into sharp focus) e. color vision	3. Discuss each of the major visual functions listed in "concepts" statement #3. For definitions of each function see the D.O.T., Volume II, pp. 655-656.	
		4. Discussion: How has the architect who designed this school provided for proper illumination? How has he failed at this?	
		5. Discuss occupations that are open to the blind and the partially blind.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
H. Sound Energy			
1. Vibration and sound are closely related.	1. Sounds are perceived differently by individuals depending on their ability to hear.	1. Conduct the following class activity: Record environmental noise in as many work settings as possible (e.g. heavy manufacturing, light manufacturing, large business offices, small offices, library, airport, bus station, hospital, department store). Play these recordings back in class. Discuss with class how the noise level in various situations affects worker mood and function.	
2. Sound is any regular vibration in matter which may be audible to the human ear.	2. Hearing is a matter of degree. Some people have partial hearing losses.	2. Conduct the following class activity: Have students perform a task which requires considerable mental concentration while distracting noises (loud or those peculiar to the work situation) are produced by the teacher. Then have them perform a simple task (such as making a paper airplane), a routine or	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		habitual task and a more complex, intellectual-oriented task under similar conditions.' Discuss the results.	
	3. Hearing is very important in some jobs.		
	4. Sufficient noise to cause marked distraction or possible injury to the sense of hearing and/or sufficient vibration to cause bodily harm are considered job hazards.		
3. As with light, the control of sound is important in our environment.	3. The level of noise in the working environment must be tolerated by a worker in order to perform efficiently.	3. Have students interview people to ascertain the effects of noise on them. Students can do these interviews with tape recorder on noise sheet corners, in a library, in an office where soft music is being played, at a ballgane, or at home (with or without stereo). Follow the interviews with a discussion	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		on the use of music in work settings. Discussion stimulators:	
		a. How can music be used to increase the productivity of workers?	
		b. Are placid calm workers more productive?	
		c. How could music be used in school to affect productivity of students?	
		d. How does noise reduce the productivity of students?	
4. The unit of sound intensity is the decibel.			
5. The nature and intensity of vibrations and sounds around us affects us psychologically.			
6. Noise is a particular kind of sound.			
7. Hearing is the perception of sound by the ear.			

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
I. Electricity			
1. Of all the forms of energy, electricity is most useful to man. Almost every phase of daily living has been heavily influenced by man's use of electrical energy.	1. Occupations involving electricity are usually highly technical, math - science oriented jobs, or practical jobs involving manipulative skills in conjunction with a general knowledge of the properties of electricity.	1. Using a Van de-Graffe generator, leyden jar, or both, demonstrate the strength of large static charges (if this equipment is not available, or as a supplement to using it, discuss the destructive force of lightening). Discuss the relationship between static electricity and job safety. In what situations are large charges likely to accumulate? In what settings would even small discharges be disasterous? How are static charges dissipated in industrial settings?	Science Research Association Jobs in Technical Work, Pamphlet #4, Job Family Series, SRA, 1964. Science Research Association Jobs in Engineering, Pamphlet #7, Job Family Series, SRA, 1965. Science Research Association Jobs in Science, Pamphlet #1, Job Family Series, SRA, 1969. Film: "Your Future in Electronics." RCA Institutes
2. Electricity can best be understood in terms of scientific models and mathematical relationships.	2. Large static charges or high power current electricity may pose serious shock hazards to workers.	2. Discuss the differences and similarities in skills, aptitudes, interests, training time, pay, work environment, and prestige between an electrician and an electrical engineer.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
3. The electrical engineer is responsible for designing devices which depend on electricity as their source of energy.	3. Since all of us come in contact with electrical devices, some knowledge of safety procedures related to electricity is important.	3. Discuss the question "How has electricity affected your life?" Use this discussion to lead into a lesson on industrial processes which would be impossible without electricity.	
4. The electrician is responsible for installing, maintaining, and repairing many of the devices created by electrical engineers.	4. Electrical devices have made man's work easier.		
	5. Many industrial processes would be impossible without electricity.		

Part II:

LIFE SCIENCE

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
A. Taxonomy			
1. Why is it necessary to classify objects in science? The greater number of objects makes a classification system necessary.	1. In order to give order to the world of work; it has been helpful to classify occupational roles.	1. Have students examine the organization of the Dictionary of Occupational Titles. Show how the systems of taxonomy compare/differ.	1. Dictionary of Occupational Titles, U.S. Dept. of Labor (a copy should be available in the school guidance office or library).
2. Extend the field of classification of animals and plants to show how occupations are classified. Note: Occupations classified in the Dictionary of Occupational Titles as follows: Occupational Groups 0-1 Professional, Technical 2 Clerical & Sales 3 Service Occupations 4 Farming, Fishing and Forestry 5 Processing 6 Machine Trades 7 Bench Work 8 Structural Work 9 Miscellaneous: Transportation Graphic arts	2. Occupational roles have been classified according to the general nature of the job. (refer to the occupational groups under content).	2. Have students identify and define a variety of occupations involving plants and animals. (e.g. botanist, farmhand) for each of the occupational groups.	2. Mid-Hudson Area Occupational Monographs. See Appendices A and B for list of local occupations.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
All occupations have been classified with reference to some of the major work functions associated with the job. Numbers to the right of the decimal in the occupational code refer to work functions concerning data, people or things respectively. For a quick pursual of these functions and the system for classifying all job, see the D.O.T., Volume II, pp. 649-650.	3. Occupations have been classified according to the work functions performed (data, people and things) based on their importance in each specific occupation.	3. Have the students discuss classifications of work by identifying which work functions (data, people, things) are of greatest importance to certain jobs.	3. Dictionary of Occupational Titles, U.S. Dept. of Labor, Appendix A.
	4. Occupations require the necessity to learn the objects in a certain job. The jargon of various occupations is necessary for work efficiency.	4. Bring in various types and sizes of bolts, nuts, screws, nails. Classify different types of animals and plants on different pictures. Clasify different vocations and how they affect your everyday life. ex. plumbers carpenters electricans waitresses Jargon: cup of coffee - java mud over easy - flip eggs over blt - bacon lettuce & tomatoe	4b. Classification charts from local industry showing different nuts and bolts. 4b. Career Series N.Y. Life Insurance Company Career Information Service (contact nearest N.Y. Life Insurance office)

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
B. Cell Theory			
1. One of man's most useful tools for studying cells is the microscope. A microscope and its accessories are precision tools and their use requires considerable manipulative skill and visual activity.	1. Using a microscope is a complex situation in which precision work is a fundamental operation.	1. Have several students look at the same cell and describe what they have viewed. Help the entire class to note similarities and differences in student perceptions of pertinent details.	1. Bausch and Lomb Microscope Materials. Bausch and Lamb Inc. Rochester, N.Y. (single copies of various aids free to teachers)
2. There are specific procedures which must be followed in setting up,operating and controlling the microscope.	2. Finding and examing the material to be observed requires considerable judgment in the manipulation of the microscope.	2. Explain how an individual's judgment can affect his study of the organisms in the pond water.	2. Pamphlet: Search and Research by Ruth Wenner. National Dairy Council 11 North Canal Street Chicago, Ill. ($.20
3. Most lessons involving the use of the microscope are appropriate to demonstrate the skills and functions associated with the operation and the use of the instrument. ex. Use of slides of pond water to be examined at various magnifications.	3. Manipulating the microscope and determining the precise settings requires both finger dexterity (ability to manipulate the slide adjuster with the fingers accurately and precisely) and motor coordination (ability to coordinate eye and finger movements in making small and gross adjustments to the microscope settings).	3. Demonstrate how to make settings on the microscope indicating how finger dexterity and motor coordination contribute to the manipulation of the instrument.	3. Film: The Very Small. AIBS Film Series.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	4. Form perception is important in making visual comparisons and discriminations in shapes, size and shadings of the content under observation.	4. Demonstrate the precise nature of making fine adjustments to the microscope.	4. Filmstrip Series The Microscope and Its Uses. SVE Inc. ($21.60)
	5. Use of the microscope involves situations of a highly scientific nature in which the worker studies minute objects and organisms often in isolation from his fellow workers. Critical decisions are based on his evaluations.	5. Have each student prepare slides of unknown specimens and describe and evaluate his findings in small groups or in the larger class situation. Conclude with an evaluation showing how important observations and reports of these are to other people.	5. D.O.T. Appendix A (Aptitudes and Temperaments) U.S. Dept. of Labor.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Green Plants			
1. Green plants are vital to our environment.	1. Our food supply is determined directly or indirectly by green plants.	1. Show through visual aids that any life cycle includes green plants.	1. Film: The Food Cycle and Food Chains, Cornet Films, 1968.
	2. The farming industry was responsible for growing and controlling our food supply. Today, the control of our food supply lies in the processing and storage of foods.	2. Have students plant a vegetable garden in the classroom. As the project proceeds, discuss the kinds of work different class members are doing. Point out how the farmer must perform all these tasks.	2. Local Farmer
	3. Man is dependent upon green plants.	3. Discuss how man's neglect and destruction of the plant kingdom, both on land and in the sea, could lead to disasterous effects. Discuss how his neglect already has brought about changes in plant life and what is being done to alleviate the problem. Discuss new jobs which have been instituted due to man's destruction.	3a. Navarra, Life and the Molecule. Harpet & Rowe, 1966 p. 392. 3b. Filmstrip: The Ecological Crisis, S.V.E. ($69.00).
	4. Green plants can produce their own food by the process of photosynthesis.	4. Use the idea of the photosynthetic process, to show how man has broken down compounds to produce other valuable products, through scientific research.	4. Film: How Green Plants Make and Use Food, Coronet Films, 1968.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
D. Human Body 1. Abilities and disabilities of the human body and mind affect our total growth. a. Specific capacities and abilities are required of an individual to adequately perform certain tasks.			For help in identifying films or video tapes that can be used, contact the Mid-Hudson Career Development and Information Center, or see section of General References for teachers in this guide.
1. Aptitudes Intelligence Verbal Numberical Spatial Form Perception Clinical Perception Motor Coordination Finger Dexterity Manual Dexterity Eye-Hand-Foot Coordination Color Discrimination	1. Certain jobs and tasks have a need for different aptitudes. Development of the mind can further the proficiency of certain aptitudes.	1. Show films of workers doing jobs that require particular aptitudes and physical demands.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
2. Physical Demands Strength (Life, Carry, Push or Pull) Climbing & Balancing, Stooping, Kneeling, Crouching and/or Crawling, Reaching, Handling, Fingering and/or Feeling, Talking and/or Hearing, Seeing .0.T., Volume II, pp. 53,655-656)	Certain job duties require specific physical demands of the body.		
2. Maturation of the body and mind are developed through adolescence.	2. Body builds differ. Body build can effect our behavior.	2. Use various students to show how different body builds affect the abilities of persons to perform various physical feats.	2. D.O.T., Dept. of Labor Appendix A.
3. Physical disabilities can affect the performance of workers in accomplishing certain specific tasks. However, there are usually other tasks that physically handicapped workers can do.		3. Discuss the phrase "I could do that with one hand tied behind my back or blindfolded". Have students perform tasks with similated disabilities. Ex: Tie shoelace with eyes closed and with one hand.	3. Filmstrip Series Principles of Biology. 2 Sets each set $24.00 - McGraw-Hill.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		4. Discussion Questions: a. What is a disability? b. How will a disability affect your adult life? c. How do disabilities affect job opportunities? d. What occupations help the handicapped to improve their skills and abilities?	4. Film: Behavior AIBS Film Series
	5. Disabilities are often unpreventable. Physical and mental disabilities reduce occupational opportunity but do not eliminate it.	5. Conduct a general discussion of the kinds of opportunities that exist for handicapped workers.	5. Mid-Hudson Area Occupational Monograph June 1971.
	6. There are many jobs involved in helping the handicapped develop their abilities. These jobs require an interest in working with people.		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
E. Nutrition			
1. Good nutrition is necessary for a sound healthy body.	1. The American people are eating a great deal more today than ever before.	1. Discuss with students the reasons why there is more food today although the agricultural manpower has been constantly declining.	1. "Agriculture and the Public Interest", by Leon H. Keyserling, Conference on Economic Progress 1001 Commecticut Ave. N.W. Washington D. C. 1965. ($1.00) p. 123
	2. This great quantity of food has made the American public diet conscious. Reducing diets should be nutritionally sound.	2. Enable students to understand why doing on a self-imposed diet can be dangerous to the body. Show students (by using the ads in papers) the great increase in diet pills and other products being sold today.	2. Pamphlets: "Food and You, The Wonder of You". American Institute of Baking Publ. 400 E. Ontario St., Chicago, Ill.
	3. A dietition is responsible for planning nutritionally sound menus.	3.a) Question: Who is considered a dietition? ex. mom, school cafeteria director.	3a. Dietetic Publications send for catalog of publications on diets nutrition & careers in dietetics. American Dietetic Association 620 N. Michigan Ave. Chicago, Ill.
		b) After discussing the nutritional value of different foods, have students prepare a days' menu which is nutritionally sound.	b. School Dietetion
		c) Take the menus for the week from the school cafeteria and break them down into the different food categories.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		d) Guest Speaker Have the school dietition discuss how she plans menus and what her job is like.	d. Food and Nutrition Series (Filmstrips) McGraw-Hill Set of 5 - $31.50
	4. Good nutrition has contributed to longer life and changes in physical attributes.	4. Have the students show through anthropological studies how man's physique has changed and how his life span has increased. Discuss the possible effects of nutrition on these changes.	4 a) Premier Books: 1. Man & His Ancestry - $.75 288 pages. 2. Mirror for Man $.60, 272 pages. Faucett World Lib. 67 W. 14 St. New York, N.Y. b) School Nurse
		5. Visit a food processing plant.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
F. Genetics			
1. Genetics is the study of heredity, or the handing down of traits from parents to offspring.	1a. A geneticist is a man who must speculate on the basis of what he observes. He then tests his speculation by scientific experimentation. b. He must be able to compile, analyze, and synthesize data under precise working conditions. Intelligence and imagination are needed in order to design effective experiments. Preparation for this job involves many years of schooling.	1. The teacher should design an experiment to be conducted by students using Drosophila to show how various traits are transmitted by parents to offspring. Following this experiment discuss with class (1) the skills and aptitudes that were necessary to perform the experiment; (2) what other occupations require similar skills and aptitudes?	1. Navarra, Life and the Molecule. Harper & Rowe 1966, p. 244.
	2. Some human traits are transmitted; others are not.	2. The teacher should define and describe human traits transmitted to offspring from parents. To what extent are traits determined by genes. Special consideration might be given to these areas: 1. physical appearance 2. intelligence 3. personality characteristics	2. Film: Nature and Nurture. AIBS Film Series.
	3. Future generations of man may be affected by further knowledge of genetics.	3. Conduct a discussion on planned families, and planned characterisitcs. Initiate discussion with these questions:	3. Film: Heredity & Environment Coronet Films, 1968.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		3. (cont'd) a. Would you want a planned family? b. What characteristics would you want for your children? a) physical b) personality c) aptitudes c. What do you think will happen if we are able to breed men with highly specified characteristics.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
G. Ecology			
1. Ecology is the science of the inter-relationship and interdependence of living things and their environment.	1. Business and industry play a vital role in determining the quality of environmental conditions.	1a.) After discussing ecology in depth in terms of Survival of Plants and Animals, point out that human ecology exists on a level other than basic survival Have students draw a diagram showing the interdependence of occupations. (Hopefully, this will make students more aware of the many occupations, of their contribution to man's way of life and their mutuality).	1. "1971 National EA Index", National Wildlife Federation.
		b. Invite a representative of local industry to discuss what his company is contributing to pollution control.	
2. There is a need for the interdependence of man in the ecological scheme.	2. There are many new occupations in environmental management.	2a.) Invite a representative of the State Department of Environmental Control to come in and talk about his job.	2.a) Career Opportunities Ecology, Conservation, and Environmental Control. J.G. Ferguson Publishing Co. 1971.
		b.) Ask students to identify and discuss career opportunities in ecology and environmental control.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	3. Men in different occupational roles must become responsible collectively, to bring about an era of ecological reconstruction.	3a.) Show through discussion how the fishing industry in areas of the country are significantly related to manufacturers of high phosphate detergents and/or other polluters of our waters.	3a.) Film: This Wasting Land, Bureau of Land Management, 1966. Free.
		b.) Have students prepare a slide show illustrating the local pollution situation.	b.) Film: Touch of Nature, Wilkie Bros. Foundation, 1970. Free.

VOCATIONAL DEVELOPMENT AND THE SOCIAL STUDIES CURRICULUM OF NEW YORK STATE (GRADES 7, 8 and 9)

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INTRODUCTION
TOPIC 5 - N. Y. IN THE AGE OF HOMESPUN, GRADE 7
TOPIC 5 - ECONOMIC EXPANSION (1865-1900), GRADE 8

The following series of lesson suggestions is an attempt to show how concepts pertaining to the world of work can be integrated into the 7th, 8th and 9th grade social studies. From the suggestions that have been developed in the following units, it is hoped that social studies teachers will see possibilities for incorporating vocational awareness concepts into other topics included in the social studies curriculum.

Not every subject in topic 5 (grade 7) and topic 5 (grade 8) has been developed in the following suggestions. The lesson plans are merely a group of suggestions. They are designed in a way to allow the teacher to incorporate his specific techniques in the application of the concepts developed. For a complete unit outline of New York in the Age of Homespun (grade 7) and Economic Expansion - 1865-1900 (grade 8) see pp. 27 - 39 and pp. 101 - 111 respectively in the Social Studies Tentative Syllabus; Grade 7 and 8.

For the ninth grade social studies program in Asian and African Culture a variety of resource lessons have been prepared. While these lessons are randomly planned they can be readily adapted to a variety of curriculum situations. These materials and the concepts which they will hopefully expose are designed to enrich the vocational maturation of the student as he examines and relates his own goals and directions within the context of other cultures and the experiences of other people.

AGE OF HOMESPUN

7TH GRADE SOCIAL STUDIES

LESSON 1

AGE OF HOMESPUN
7th Grade

I. Ability of man to establish control over natural forces

   Clearing fields for grain cultivation
   Diminishing reliance on hunting and fishing
   Intro of stock: meat, dairy and draft animals
   Development of marketing centers
   Development of roads
   Improvement of housing - log cabin to frame construction

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Intro to Age of Homespun Ability of man to establish control over natural forces.	1. Age of Homespun was an age of self-sufficiency.	1. What tasks does a 7th grade student perform that indicates self sufficiency?	1. Filmstrip: Conquering the Wilderness, Eye Gate House 146-01 Archer Ave. Jamaica, N.Y. 11435
	2. Man had to have ability to perform many tasks.	2. What specific skills do you have? (ask individual students)	
	3. Man had to have diverse skills.	3. Could you see situations arising that would cause you to immediately develop skills you think you don't have now?	2. Van Wagener, Jr., Jared, Golden Age of Homespun, Hill and Wary, 1953. Chapters 1,2,3,4.
	4. Man had to adapt to new situations in the Age of Homespun.	4. Identify some situations to which you feel you have had to adapt.	
	5. Man must adopt to new situations today.	5. Form several buzz groups to discuss the difference between Homespun man and modern man.	
	6. In Age of Homespun man worked to subdue and control his environment.	Attempt to orient toward domestic skills (e.g. household chores, repair of household items).	
	7. Today man reacts to his changing environment.		

LESSON 2

AGE OF HOMESPUN
7th Grade

II. Homespun terminated with the decline of self-sufficiency and shifting of economy away from agricultural base

- A. Needs no longer met through home or local manufacture
  - Beginning of use of factory made textiles
  - Importation of manufactured goods for use in the household
- B. Local industry no longer largely farm related
  - Products produced for a much wider demand than that of agricultural household
  - Majority of indus. operations no longer centered on processing farm products

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CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Homespun terminated with the decline of self-sufficiency and the shifting of the economy from an agricultural base.	1. Mechanization brought specialization.	1. What is meant by mechanization and specialization?	(1) School guidance office for career pamphlets.
	2. Technology created the need for new skills and made other skills obsolete.	2. Why does mechanization increase productivity? ex: of any product machine made vs. man-made. (assembly line - mass prod.)	
	3. Mechanization increases productivity.	3. What could man do with his surplus production? a) He sells surplus b) He receives money for surplus c) He uses money to buy things he used to make. ex: buys shoes rather than making them.	
	4. Homespun terminated when subsistence agriculture became surplus agriculture as a result of mechanization.	4. What do members of your family do to make a living? (See work experience questionnaire)	see "Work Experience Questionnaire" appended to this section.
	5. Each individual must begin at some time to consider what he will do with his time.	5. Have you any idea of what you would like to do to make a living?	
	6. Most jobs require some type of preparation.	6. Have each student express some occupational interests, and have students explore skills and training associated with chosen occupation.	

LESSON 3
AGE OF HOMESPUN
7th Grade

III. Geographic features of Central N. Y. were favorable for the developmentof a largely self-sufficient agricultural based economy

- A. Use ofnatural resources (forest) for construction
  - Barrels and buckets from white oak
  - Nuts, fruits, maple sugar augment food
  - Potash from various deciduous trees

- B. Use of Waterways for shipping
  - Susquehanna and Delaware for grain to Eastern markets
  - Flour-milling centers on rivers near wheat growing areas
    1. Albany before Rev. - Hudson and Mohawk Valley Graneries
    2. Rochester in mid - 19th Cent. - Genesee Valley Granary

- C. Favorable climatic conditions existed for raising grain, feed crops, hops
  - Rainfall 30 - 50 inches per year - few floods
  - Favorable growing season
  - Infrequent violent winds and storms

- D. Soil conditions favorable for crop growing

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Geographic features of central N. Y. were favorable for the development of a largely self-sufficient based economy.	1. Geography and climate are important determinants of occupations.	1. Contrast occupations in Mohawk Valley with those in other areas of N.Y.S.	(*Golden Age of Homespun*, Chapters 8,11,12,14.
	2. Geography is important in industry as well as in agriculture.	2. What were the geographic features of Central N. Y.?	
	3. Heating and air-conditioning have helped to overcome certain geographic limitations.	3. What are some examples of how technology has overcome geographic determinants?	
		4. See D.O.T., Volume II, p.655-656, for definitions of various working conditions.	

LESSON 4

AGE OF HOMESPUN
7th Grade

IV. Self-sufficiency made necessary the raising of a variety of crops on the Homespum Age Farm

Field crops included grains and cereals for human consumption, as well as feed for stock

Farm animals were necessary for transportation, food, clothing materials

Flax was an important crop on most farms through most of the Homespun Age; its durability and usefulness, made it a necessity for household textiles and clothing

Herbs and medicinal plants were grown in kitchen gardens

Money crops gave cash for the few items which had to be purchased at the marketing center:
  Wheat, whiskey, and potash the three most common items of eastbound freight on the Erie Canal
  Hop production in central New York very important toward the end of the period, when long distance travel made possible the production for the national brewing industry

The kitchen garden included a variety of vegetable crops:
  Potatoes
  The Iroquois staples of corn, beans, and squash
  Gourds used for dippers and household utensils

Orchard fruits were developed from European strains, imported in colonial times

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Self-sufficiency made necessary the raising of a variety of crops on the Homespun Age Farm.	1. Climate and soil determine crop types.	1. Review of Central N.Y. geographic factors.	1. Golden Age of Homespun, chapters 5,8,9.
	2. Man learns to utilize tools needed to accomplish various tasks.	2. What tools were used by Homespun farmer?	2. Filmstrip: Farmer's Year, Modern Learning Aids, 1212 Avenue of Americas, N.Y., N.Y. 10036.
	3. A power source is necessary to accomplish a job.	3. What are examples of power sources?	
	4. Man in Age of Homespun was often the power source.	4. Cite examples of how various farm tasks were accomplished in Age of Homespun,(e.g. muscle and animal).	
	5. In today's society man operates and maintains various sources of power.	5. What forms of power are used today? (1. engine 2. electricity).	
	6. Man must adapt to new technology.	6. What new implements developed to advance farming technology?	
		7. What new skills or functions are necessary in operating and maintaining the new power sources? 1. mechanical ability 2. electrical knowledge 3. soil conservation (See Appendix A, D.O.T. Volume II, p. 649 - Date, People, Things for terminologies concerning work functions).	

LESSON 5
AGE OF HOMESPUN
7th Grade

V. Many products needed for farm and home use were partially or completely manufactured in the household

Tools and implements were made by the farmer, with assistance of the local blacksmith, if iron were required. Examples included:

- The axe, the single most important tool
- Ox-yokes
- Scythes and cradles
- Sap buckets
- Simple home furnishings

In the early homespun years, almost all textiles used in the home and for clothing were produced by the household

Pride in the quality of workmanship and creativity in design was reflected in many of these products manufactured in the homes

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Many products needed for farm and home use were partially or completely manufactured in the household.	1. In Age of Homespun, man needed not only the ability to use tools, but also make and repair tools.	1. What is a tool? 2. What tools were needed by the homespun farmer?	1. *Golden Age of Homespun*, Chapters 12,20.
	2. Man had to be efficient with his hands.	3. Have you ever made tools (in order to accomplish a task you've set out to do)	
	3. Man derives satisfaction from personal accomplishment.	ex: ever used a stick as a lever to move something?	
	4. Satisfaction and pride are important aspects of accomplishing a job.	4. Is there satisfaction in making something? (establish the idea of pride). ex: model airplanes	
		5. Can you get similar satisfaction from doing a successful job in school?	
		6. Do your parents ever speak of satisfaction and pride in their job?	See work experience questionnaire.
		7. Would satisfaction and pride in your work be desirable? (discuss relationship of job satisfaction and pay).	
		8. How do you derive satisfaction on a job? Use example of any specific job.	See Appendices A and B for list of jobs in the local area which could be used.

LESSON 6
AGE OF HOMESPUN
7th Grade

VI. In the Homespun Culture, most non-agricultural workers were engaged in supplying goods and services for farmers.

Carpentry remained the most important non-agricultural occupation during most of the period, in view of such factors as:
- Building needs of a growing community
- Abundance of wood as construction material

Some other suppliers of needed products included:
- Cabinet makers
- Blacksmiths
- Coopers
- Cobblers
- Millers
- Charcoal burners

Location of non-agricultural industries was geographically considered

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
In the Homespun Culture, non-agricultural workers were engaged in supplying goods and services for farmers.	1. As technology advanced, occupational interdependence increased.	1. What supporting occupations were necessary in the central N.Y. farming region during the Age of Homespun?	Filmstrip: Pioneer Artisans, Eye Gate House, Inc., 140-01 Archer Ave., Jamaica, N.Y. 11435
	2. Homespun man was more self-sufficient than 20th century man.	2. Why could Homespun be more self-sufficient than you are?	
	3. As products increase, man's necessities increase.	3. Can a skill become obsolete? (define obsolete and give examples) 1. R. R. fireman 2. Switchman (See Appendix A, D.O.T. P. 649, Volume II, for skill definitions)	Golden Age of Homespun, chapters 13,15,16,18,19
	4. The more skills a man has, the more self-sufficient he can be.	4. What happened to these people when their jobs no longer existed?	
		5. How can you protect yourself from job obsolescence?	

LESSON 7
AGE OF HOMESPUN
7th Grade

VII. Processing of farm products for home use or export to outside communities as a cash source was so important that the location of these processing units determined the development of the area of settlement concentration, for example:

Grist mills and saw mills located on streams with a steady enough flow to assure a source of power
Location of asheries near stands of elm or other timber desirable for charcoal
Tanneries and fulling mills found in area in which there was livestock on most farms

Most mill operators and craftsmen owned their own businesses, including tools and equipment and employed apprentices or seasonal additional labor if business warranted it

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Processing of farm products for home use or export to outside communities as a cash source was so important that the location of these processing units determined the development of the area of settlement concentration.	1. People concentrate around job area.	1. Where do people live?	Golden Age of Home-Spun, Chapter 16
	2. Natural resources are a determinent of industrial development.	2. Why do people live here? establish what is done in your area.	
		3. Name industries in your area.	Contact Mid-Hudson Career Development and Improvement Center for help in identifying industries in the area.
		4. Whose families in the classroom work for these industries.	
		5. Whose families make a living because the population working in these industries live here.	
		6. What industries developed to support and serve the farmer during the Age of Homespun?	
		7. Where (geographically) did these industries develop?	

LESSON 8
AGE OF HOMESPUN
7th Grade

VIII. Space patterns on the farm and in the household were determined by efficiency, by health factors, and by the use made of the space patterns by men and by women.

Fields were planted or designed as pastures in relation to difficulty of cultivation.

Fences made of wooden rails, stumps or field stones depending upon the availability of material, were used to keep stock out of grain fields.

Barn location was affected by such considerations as:
  Care of stock during winter storms
  Access of road (important in muddy season)
  Health factors: control of flies and other pests
  Relationship to rest of mens work area, fields, woodshed, pastures

Location of kitchen garden was related to other work areas of women: the kitchen, and such outside areas as those where poultry was fed, soap boiled, and so forth.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Space patterns on the farm and in the household were determined by efficiency, by health factors, and by the use made of the space patterns by men and by women.	1. Man searches for most efficient methods of completing tasks. 2. Many different work functions were performed on the homespun farm.	Class project: Design layout of a farm. (Homespun Farm) 1. What would various components of a farm be? (Barn, house, pastures, etc.) 2. Where should components be located? 3. W hat functions were necessary for farm to function successfully? (List according to definitions in Appendix A,D.O.T. p.649,Vol. II) 4. Be sure to understand various equipment needed to accomplish #3. (e.g. milking cows, raising crops, or equipment maintenance). Note: this can be a construction project; individual or group design for overhead projection.	

LESSON 9
AGE OF HOMESPUN
7th Grade

IX. Division of time in the Homespun period was tied to the daily and seasonal pattern of agriculture.

The limits of daylight were important in setting a beginning and end to the household day.

  Winter required some use of lantern and candle to achieve an extra hour or two for chores
  Demands of care for stock and poultry forced early rising for the household

The work pattern determined the schedule of the day, forexample:
  Breakfast after certain chores and stock care completed
  Daily heavy meal usually at noon
  Evening meal at end of farmer's fieldwork time

The year was planned in terms of the farmer's work, and school attendance reflected this:
  Winter months for repair of tools, buildings, equipment: children attended school
  Spring's heavy work in preparation of soil, planting: some absence from school
  Summer a time of cultivation, haying, harvest, preparing buildings for winter: children often needed in the fields until frost

Vacations and leisure time as we think of them were unknown, because of:
  Daily care of stock, poultry, replenishment of woodpile necessary, regardless of day's plans
  Womans work of meals and care of household constant

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Division of time in the Homespun period was tied to the daily and seasonal pattern of agriculture.	1. Farming is a seasonal occupation 2. Before the development of electrical power, work was a daytime activity. 3. During Age of Homespun leisure time did not exist.	1. Show filmstrip. 2. Compare life on Homespun Farm with life on modern farm in the same region. 3. What had to be done during what we consider to be "time off"? (see content) 4. Compare non-employed time of the modern worker with that of homespun man.	1. Filmstrip: The Farmers Year Modern Learning Aids, 1212 Ave. of Americas N.Y., N.Y. 10036

LESSON 10
AGE OF HOMESPUN
7th Grade

X. The differing roles of men and of women in the Homespun Age are highlighted in defining the functions of the family in that culture.

The family was the chief production unit, in terms of the basic needs of its members: men and women divided the tasks in accomplishing this:

	MEN	WOMEN
Food	Raising of field crops Care of livestock Preparation of planting areas Harvest Butchering Occasional manufacture of utensils	Care of kitchen gardens Care of poultry Preparation of food for table Preservation of food
Shelter	Building of house and outbuildings Construction of furniture (or accumulation of cash income to pay for any of the above) Repair of house and outbuildings Raising of textile raw materials for household articles	Care and cleanliness of living quarters, furniture, production of textiles for household use
Clothing	Raising of textile raw materials, leather Accumulating cash to pay for cobbling, other leather work	Production of textiles for clothing Making, repair of clothing Cleaning of clothing

LESSON 10 continued
AGE OF HOMESPUN
7th Grade

	MEN	WOMEN
Health Preservation	Responsibility for supplying firewood and water for household use Accumulation of cash to pay for medical services in extreme cases	Production of soap Home nursing Production of home remedies and medicines
Rearing of Children	Education of in vocational skills Training for work on a similar farm Often some responsibility in religious training	General care of babies and younger children Training of girls in household arts.

Single or widowed women attached to the household helped perform women's tasks. Boys performed men's tasks as soon as physical strength permitted. Both boys and girls were considered mature at an earlier age than in our culture.

LESSON 11
AGE OF HOMESPUN
7th Grade

XI. The rapid expansion of turnpike in the first three decades of the Nineteenth Century hastened the transformation of many frontier areas into Homespun Age settlements.

Sale of lands in central and western New York, and demands for supplies at military outposts during the War of 1812 encouraged the extension of turnpikes throughout most of the State.

(names and locations of various Turnpikes)

By 1821 about 4,000 miles of improved roads had been built through the efforts the efforts of over 250 private companies, chartered by the State Legislature.

LESSON 12

XII. Although the Turnpike routes made communication between most communities possible, the conditions of travel discouraged frequent trips and made a high degree of self-sufficiency necessary.

Some of the conditions discouraging much travel over Turnpikes included:
Deterioration of roads due to harsh weather conditions
Distance between settlements and inns
Physical discomforts of stagecoach travel
Expense of Turnpike travel: development of shunpikes an indication
Time required for travel. Freight transport covered only about 20 miles a day.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
The differing roles of men and of women in the Homespun Age are highlighted in defining the functions of the family in that culture.	1. Sex has historically been an occupational determinent.	1. Develop an understanding of division of labor in the students' families. 2. What are some traditional divisions of labor in our society? 3. Develop a list of division labor on Homespun farm (see content). 4. Point out the conventionality of the occupational preferences from list developed in lesson #2.	1. Filmstrip: The Woman's World, Modern Learning Aids, 1212 Ave of Americas, New York, N.Y. 10036 2. Golden Age of Homespun, Chapter 22.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
11. The rapid expansion of turnpikes in the first three decades of the 19th century hastened the transformation of many frontier areas into Homespun Age settlements.	1. Transportation availability is a factor in industrial growth. 2. A surplus economy can not exist without transportation. 3. The toll road is part of today's transportation facilities.	1. What forms of transportation do modern industries depend on? (Show that these did not exist at the beginning of the Age of Homespun). 2. Without transportation what would a Homespun farmer do with surplus crops?	FILMSTRIP; Travel in Pioneer Days, Eye Gate House. FILM: Thruway, Main Street, New York State Department of Commerce Films Library, 40 Howard St., Albany, N.Y. 12207.
12. Although the Turnpike routes made communication between most communities possible the conditions of travel discouraged frequent trips and made a high degree of self-sufficiency necessary.	4. The lack of transportation made Homespun homespun. 5. Homespun was the necessary result of isolation. 6. Age of Homespun declined with the development of transportation.	3. What factors contributed to the ending of the Age of Homespun? a. development of transportation b. specilization of labor c. surplus economy	

LESSON 13
AGE OF HOMESPUN
7th Grade

XIII. Competition with other forms of transportation, plus a growing responsibility for improving the roads, brought the gradual decline of the turnpike companies.

The Erie Canal drastically reduced the cost of shipping freight and encouraged a rapid expansion of the use of water travel, as may be seen by:

Development of feeder canals at State expense
Private building of canals to connect coal fields of Pennsylvania with New York State markets

Rail transportation began in New York in the 1830's and spread rapidly through the State during the next two decades:
(list of various RR. lines and locations)

More local interest and responsibility in maintaining highways and bridges developed during this period, utilizing the following methods:

Selection of town commissioners of highways to oversee repair work
Assessment of several days of roadwork from each adult male resident
Division of towns into road districts with overseer in charge of work in that district

Most turnpike companies failed to earn enough money to pay for repairs.

LESSON 14

XIV. Life in communities of this period was profoundly changed as the canal or the railroad reached them.

Changes included:
Development in canal villages of facilities for food, lodging and recreation of crews and passengers, as well as businesses to handle goods shipped by canals
Competition among communities for railroad services, some contributing part of the cost of construction
Many new non-farm-related occupations
Transformation of self-sufficient farmer to a commercial farmer sensitive to shifts in the markets

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
13. Competition with other forms of transportation, plus a growing responsibility for improving the roads, brought the gradual decline of the turnpike companies.	1. New technology creates new jobs. 2. New jobs mean new skills. 3. In today's world people must maintain a position of retrainability.	1. Create a map of a small central N.Y. area during Homespun. A. Show various turnpikes on map. B. Discuss jobs related to turnpike operation (e.g. toll booth operator, gate operator, repair crews). C. Indicate introduction new forms of transportation. D. Why does turnpike now become obsolete? E. What becomes of turnpike job holders? F. Discuss jobs related to canal and railroad transportation. G. Indicate retraining and new jobs for turnpike workers on canals and railroads. H. Refer to lesson #6, Techniques #3,4 and 5. Show how these relate to this lesson. (continued)	Film: ONCE UPON THE ERIE CANAL, (14 minutes,rent $7) Syracuse University, 1455 East Colvin St., Syracuse, N.Y. 13210.
14. Life in communities of this period was profoundly changed as canals and railroads reached them.	4. In the current world of work, automation is one of the basic causes for the obsolescence of jobs.		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		2. Using map again, indicate how the coming of the canal and railroad brought industries and related services to a community (e.g. introduce a grainery in a village). (relate to topic #14) Note: These techniques will need to be developed over a period of several days.	

LESSON 15
AGE OF HOMESPUN
7th Grade

XV. The Homespun Age saw a revolution in the sources of power for Transportation

The power revolution included:
- Horses replacing oxen on farms
- Steam power replacing animal power for public transportation
- Continued use of animal-powered packets on the Erie Canal
- Continuance of the horse as chief source of private transportation until the motor age

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
The Homespun Age saw a revolution in the sources of power for transportation.	1. New power sources increased individual productivity. 2. New power sources demand new skills.	1. Use example of hauling hay on a farm. a. man pulling wagon b. horse pulling wagon c. tractor pulling wagon Show how farm work functions changed with each operation. (Refer to previous lessons on changing skills)	

LESSON 16
AGE OF HOMESPUN
7th Grade

XVI. The Homespun Age in New York State was marked by various efforts to win public support for schools, to improve the quality of education, and to extend opportunity to more pupils.

Many children did not attend school during this period; important reasons included:

Parents would not sign pauper's oath
Children were needed at home to work on the farm
Compulsory school law was not passed until 1874
Gradual decline of private academies by the end of the period, as public high schools developed

The pressure for more education for women increased during the Homespun Age. Academies for girls were founded during this period, for example the Emma Willard Female Seminary in Troy.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
The Homespun Age in N.Y.S. was marked by various efforts to win public support for education in order to improve the quality of education and to extend educational opportunity to more pupils.	1. School in the Age of Homespun was a preparation for life on the farm. It consisted mainly of the 3 R's. 2. Modern schools prepare students for a more complex way of life.	1. Show filmstrip frames on schools. 2. How have schools changed? a. in design and appearance b. in program c. in teaching-learning methods.	1. Filmstrip: Growing Up in Homespun, Modern Learning Aids 1212 Ave.of Americas N.Y., N.Y. 10036. 2. Filmstrip: Children at Home and School, Eye Gate House, 145-01 Archer Ave., Jamaica, N.Y. 11435.

LESSON 17
AGE OF HOMESPUN
7th Grade

XVII. Through legislation and increased public interest, the Negro made gains during the Homespun Period.

Gains were built upon legislation passed previous to the Homespun period.

Slave trade to New York curtailed in late 18th century
Children born of slave parents after 1799 freed upon attaining adulthood
Slavery officially ended in New York State in 1827. The State constitution, however, imposed more stringent voting requirements upon the Negro until after the Civil War.

Abolitionist Movement

Although Homespun Society was relatively homogeneous in religious composition, life in that culture was conducive to the development of many variations in religious practice and beliefs.

Migrants from New England and the eastern seaboard brought to central New York the less ritualistic Protestant churches.

There was a general attitude of optimism among those who had established farmsteads in a new country; the perfectibility of man was a matter of great enthusiasm to many, who saw improvement as a theme of the age. Religious movements reflecting this theme included:

Revivals and camp meetings, often by established churches
The Millerites
The Mormons
The Spiritualists

LESSON 1
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

IN THE POST CIVIL WAR ERA THE FRONTIER CONTINUED TO ATTRACT SETTLERS BUT TO A LIFE QUITE DIFFERENT FROM THAT OF EARLIER FRONTIERS.

Vast farmlands were made accessible to Easterners and to land-hungry immigrants, at first chiefly from northwestern Europe but later from southern and eastern Europe:

Easier access by the terms of the Homestead Act
Attraction of potential settlers by advertisements posted by American railroads in the East and in Europe

The long drive and the cattle towns
Struggles between cattlemen and sheepherders
Clashes of cattlemen and homesteaders

The homesteader had few comforts in adapting to his environment:
The discomforts of the sod house
Isolation, especially during severe winters
Remoteness from schools or medical services
Problems of drought, floods, tornadoes, extremes of temperature

Lawless elements sometimes fled to the frontiers and preyed upon the isolated and unprotected farm families

Indian resistance to white land acquisitions continued until late in the nineteenth century and endangered the white settlements:
Wars against Apaches, Navajos, Sioux, Nez Perce
Federal programs to restrict Indians to reservations
A new look at Indian problems in Helen Hunt Jackson's A Century of Dishonor (1881); the Dawes Act, 1887.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Through legislation and increased public interest, the Negro made gains during the Homespun period.	1. Personal prejudices carry over into jobs. 2. Man must learn to deal with prejudice on the job. 3. Need for tolerance has increased as more different groups have become part of our society.	1. In our community what different racial or ethnic backgrounds are present? 2. Have the class identify and discuss examples of racial or ethnic prejudice in their community. 3. Visit a local industry and have members identify the types of work performed by various minority group members. Discuss their observations.	

ECONOMIC EXPANSION (1865 - 1900)

8TH GRADE SOCIAL STUDIES

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
1. In the post-civil war era the frontier continued to attract settlers but to a life quite different from that of earlier frontiers.	1. Different jobs have different working conditions.	1. Describe the working conditions of the cowboy. (one could sinstitute a description of a miner's or a homesteader's working conditions) 2. Develop a list of working conditions for an industry in your community. 3. Have students discuss the types of working conditions they would seek or avoid.	1. Monaghan, Jay The Book of the American West, Julian Messner, pp. 328-333. 2. See the D.O.T., Volume II, Appendix for a description of various working conditions.

LESSON 2
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

FRONTIER FARMER DEPENDENT ON EASTERN BANKERS AND RAILROADS

Eastern manufactured goods were necessary for the new frontier farming, for example:

The fence, to keep stock in the ranch or out of the grain fields
The steel plow to cut the tough sod of the grasslands
The reaper, a necessity for the extensive agriculture of the wheat belt

Eastern bankers provided the credit the farmer had to have for:

Meeting mortgage payments on his land
Purchasing machinery, tools, draft animals
Starting each new season with seed, fertilizer, wages for farm hands
Feeding and clothing his family until he could market his crops

The railroad furnished the farms necessary services, for example:

Replacement of the covered wagon as transportation to the frontier
Bringing machinery and other materials from eastern suppliers
Carrying farm products to eastern markets

With each passing year, the farmer became more aware that he was largely at the mercy of the Eastern railroad magnate, banker, and manufacturer.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
2. The frontier farmer was dependent on the Eastern bankers and manufacturers and on the railroad.	1. Jobs in an industrial society are interdependent.	1. Identify a number of local jobs and determine their inter-dependence with other jobs.	See Appendices A and B for a list of local jobs. Also, the "Work Experience Questionnaire" may be used to identify jobs about which the students readily gain more information.

LESSON 3
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

IN THE POST-CIVIL WAR PERIOD THERE WAS A GREAT EXPANSION OF HEAVY INDUSTRY

New industries emerged, first in materials needed by the railroads such as steel to replace the less durable iron rails. Other developments of note included:

Introduction of the Bessemer process
Beginning of the Carnegie fortune
Exploitation of Lake Superior iron resources
New urban centers: Pittsburgh; Birmingham: The "New South";
Great Lake centers such as Gary and Buffalo
Steel's effect upon other industries: for example, coal and coke developments.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
3. The post-Civil War period was an era of great expansion for heavy industry.	1. Technology creates new jobs.	1. Have students investigate new industries that may develop during their lifetime: e.g. space travel, underseas industry (oceanography). Ask students to identify new jobs that may emerge if these industries materialize.	1. See D.O.T., Vol. II, Appendix A for definitions of work functions (data, people, things).
	2. Industrialization leads to urbanization.	2. What new jobs might be generated by the development of a jet port in the Mid-Hudson area?	2. See New York Times Index for articles on the possible development of a jet port at Stewart AFB.
		3. Invite guest speakers to discuss both sides of the jet port issue. Ask speakers to orient their remarks toward possible changes that may occur if the jet port is established.	

LESSON 4
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

HEAVY DEMANDS FOR CAPITAL FORMATION NECESSITATED CHANGES IN FORM OF BUSINESS ORGANIZATION.

Single ownership and partnership which were widely used in early nineteenth century industry, tended to allow close contact with both labor and the consumer, but had disadvantages for expansion :

Limited capital resources
Limited life of the business
Problems of individual liability

The structure and organization necessary for securing the capital was already in existence:

Many textile production units using the corporate structure, which became the prevalent form of business organization.
The New York Stock Exchange, founded in 1792, serving as a market for selling the securities of corporations in order to finance the building of the railroads in the 1850's and the 1860's and to finance many other business enterprises.
Continuance of individually owned or partner owned enterprises, while large businesses became almost universally corporate in structure.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
4. Heavy demand for capital formation necessitated changes in form of business organization.	1. There are different types of business structure, private, corporation, partnership.	1. Invite panelists representing the different forms of business structure to discuss the problems and responsibilities associated with the form of business organization that each participant represents.	Contact Mid-Hudson Career Information Center for help in identifying and securing guest participants for the forum. The "Work Experience Questionnaire" may suggest individuals who would be available to help.

LESSON 5
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

INCREASING ORGANIZATION, MASS PRODUCTION OF CONSUMER GOODS, AND THE GENERAL ACCEPTANCE OF BUSINESS CONSOLIDATION CONTRIBUTED TO CHANGES IN MERCHANDISING METHODS.

The urban resident, and also rural people, were becoming increasingly dependent upon outside sources for goods and services. The lower price for the mass-produced product, as compared to its custom-produced counterpart, brought increased demand for it. Changed outlets included:

Specialty stores, such as those in hardware, clothing, and groceries, which began to replace the general store.
Mail order houses, like Montgomery Ward and Sears Roebuck, which helped meet the rural demand for consumer products.
Combinations of specialty shops in one building (the department store) or branches and affiliate stores in many cities (chain stores), representing methods of spreading fixed costs and of increasing profit through quantity operations.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
5. Increasing organization mass production of consumer goods, and the general acceptance of business consolidation contributed to changes in merchandising methods.	1. New marketing methods led to the extension of services to rural inhabitants.	1. Use an opaque projector to show pages from a mail order catalog at the turn of the century. 2. Compare and contrast mail order buying, a visit to the general store, and shopping in the modern plaza. 3. Discuss the changes in advertising and merchandising methods. Identify these changes with work functions and job opportunities.	FILMSTRIP: A Pioneer Village, Eye Gate House, 146-01 Archer Ave., Jamaica, N.Y. 11435.

LESSON 6
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

THE POWER BROUGHT BY FINANCIAL CONTROL OF A RAPIDLY EXPANDING CORPORATION WAS SOMETIMES MISUSED.

Corporations combined into larger organizations to limit competition and manipulate prices by controlling markets or decreasing the number of units. Organizations included the pool, the trust, and later forms such as the interlocking directorate and the holding company.

Financiers and other businessmen often interfered in government to influence legislation or to secure government contracts. Pertinent here are:

The work of lobbies
Government - business scandals, such as the Credit Mobilier and the Tweed Ring.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
6. The power brought by financial control of a rapidly expanding corporation was some times misused.	1. The limitation of competition often leads to unfair business practices.	1. What is competition? Work from illustrations in student lives to union/industrial manipulation of rates and charges.	1. Weisberger, Bernard A., *Captains of Industry*, American Heritage Publishing, Chapter I.
	2. Work requirements for various jobs differ.	2. Read and discuss a number of monographs. Compare and contrast the job requirements.	2. Job monographs for the Mid-Hudson area from the Mid-Hudson Career Development and Information Center or from the school guidance office.
	3. Workers often compete for a job.	3. Ask a personnel manager from a local firm to talk to the class on competition in getting a job and in getting ahead on the job.	

LESSON 7
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

WRITERS AND HUMANITARIANS BROUGHT PRESSURES FOR SOCIAL AND ECONOMIC REFORM BY CALLING ATTENTION TO THE EVILS AND HARDSHIPS CREATED BY THE MISUSE OF POWER.

Some of the problems highlighted by writers include:
  Ruthless methods of industrial giants
  Poor products for the consumer
  Political graft in cities
  Slums with their unsatisfactory housing and related evils

Humanitarians worked to improve conditions, for example:
  Pressures brought by Jacob Riis to improve opportunities for slum children.
  Hull House as a model for future community centers.
  Lillian Wald's efforts which led to the visiting nurse service.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
7. Humanitarians brought pressures for social and economic reform by calling attention to the evils and hardships created by the misuse of power.	1. Uneducated people sometimes are more easily exploited than educated people.	1. Have the students define power. Discuss present day uses/missuses of power.	1. Riis, Jacob A., How the Other Half Lives.
	2. Education is increasingly significant in developing your skills and/or your potential as a worker.	2. Have students identify and read about humanitarians who sought reforms in education, labor, etc. Have students relate their findings to modern day problems and issues.	
	3. Workers join unions to protect themselves against exploitation by management.		
	4. Some industries are concerned about worker exploitation as evidenced by their grievance systems, fringe benefits plan, seniority, pension plan, etc.		

LESSON 8
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

THE FARMER SOUGHT TO SOLVE HIS BASIC PROBLEM OF NOT RECEIVING A FAIR RETURN FOR HIS LABOR BY ORGANIZATION AND POLITICAL ACTIVITY.

Railroads frequently had monopoly control of services to some farmers, and manipulated rates accordingly. An example was in the problem of long and short haul.

These efforts were made to solve the railroad rate problem:
- The Patrons of Husbandry (Grange) serving as a unifying agent to bring farmers with common problems together.
- Political activities of the Grange leading to the passage of Granger Laws, legislation regulating railroads on a state level.

Laws legislation regulating railroad rates on a state level
- After state laws were ruled unconstitutional, the federal government assuming a role of protecting the farmer against railroad abuses with the passage of the Interstate Commerce Act.

Cooperatives were formed, to permit farmers to purchase in quantity, and to give them a stronger selling position.

The Populist Party, which planned to raise prices through increasing the money supply, was chiefly a party of the farmer.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
8. The farmer sought to solve his basic problem of not receiving a fair return for his labor by organization and political activity.	1. Farmers organized to protect their interests.	1. Using materials provided by students, construct an 1880 farm region centered around a model railroad. Use a large plywood board or table to construct the model.	Holbrook, Stewart H., The Golden Age of Railroads, Random House, 1960.
	2. Work success includes a feeling of accomplishment.	2. Have the students interview workers to ascertain the types of satisfactions/dissatisfactions they have experienced in their jobs.	Use the item on work satisfaction in the "Work Experience Questionnaire" as a means for introducing the concept of work satisfaction.
	3. Lack of satisfaction lowers work efficiency and is a source of worker frustration.		
	4. Man rebels against discomfort and inconvenience.		

LESSON 9
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

PROBLEMS FOR LABOR RESULTED FROM THE RAPID CONSOLIDATION AND EXPANSION OF BUSINESS AND INDUSTRY.

Increasingly the physical and social distance between workers and the ownership group widened, with resulting loss in personal contact to alleviate bad conditions or settle grievances. Among the problems causing dissatisfaction were:

Dawn to dusk working hours, a continuance of the pattern set in our early factory years
Low wage patterns resulting from business recessions, and from increases in the labor pool
Lack of security for the worker in business recessions, periods of ill health and old age, or in unemployment caused by new processes
Dangerous and unsanitary working conditions

Unsatisfactory housing conditions resulted from increasing concentration of workers near factories and shops. These showed especially in the growth of slums and in the exploitation often found in the company town.

In supplying goods and services, large corporations sometimes overlooked the rights of the consumer, in the interests of greater profits:

Poor quality of products offered
Prices based upon "what the traffic will bear"

LESSON 10
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

LABOR IN THIS PERIOD STRUGGLED TO FIND A SUCCESSFUL FORM OF ORGANIZATION WHICH WOULD WIN RECOGNITION OF THE RIGHTS OF THE WORKER.

The Knights of Labor attempted to bring together all kinds of workers on a nationwide basis. Some of the reasons for its downfall were:

Too varied a membership to permit united efforts on common problems
A policy of secrecy, which aggravated misunderstandings
Labels of radicalism
Involvement in unsuccessful strikes

The American Federation of Labor profited by the weaknesses of earlier organization, for example:

Organization in more cohesive units, the craft unions
Emphasis upon working for collective bargaining
Avoidance, where possible, of involvement in violence and in strikes
Avoidance of political involvement

More radical groups appeared on the scene, but were usually discredited, as a result of outraging public opinion through violence, for example:

"Molly McGuires" among the miners
International Workers of the World

An important achievement of the labor movement was the shift in the attitude of the federal government toward the unions, for example:

Early attitude seen in government action in the Pullman Strike
Government sympathy of labor's side, seen in President Roosevelt's action in the Anthracite Strike of 1902
Legal acknowledgment in the Clayton Act of labor's right to form unions.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
9. Problems for labor resulted from the rapid consolidation and expansion of business and industry.	1. Man rebels against discomfort and inconvenience.	1. Play a recording of a song (e.g."Sixteen Tons") and analyze examples of the mood words or tempo of the music.	
10. Labor in this period struggled to find a successful form of organization which would win recognition of the rights of the worker.	2. Concentrations of population bring about an increase in problems of living and working.	2. Develop a list of problems associated with concentrations of population in an industrial setting.	
	3. Unions exist for the protection of the worker.	3. Discussion questions: What is a Union? What are the aims of Unions? What are the differences between the laborer (worker) and management (company bosses or officers)?	
	4. Labor and management view work problems from different points of view.	4. Have the class discuss their rights as students (workers). They might identify a number of areas where they feel their rights have been neglected or abridged. Form committees to discuss these areas and the problems they cause. This activity can be continued by having the class, acting as union representatives negotiate with school officials (management) or student government in an attempt to alleviate undesirable aspects of student working conditions.	

continued

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		5. Have a union shop steward and a labor relations representative for a company contrast the two positions and the points of view that each individual represents.	

LESSON 11
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

PROBLEMS IN ASSIMILATION OF THE IMMIGRANT POPULATION IN LATE NINETEENTH CENTURY AMERICA STEMMED FROM THE VAST NUMBERS AND THE DIFFERENCES IN CULTURAL BACKGROUND OF THIS GROUP, AS WELL AS FROM THEIR LIVING CONDITIONS IN THE UNITED STATES.

Earlier immigration had been sufficiently limited that it had supplied needed services in our growing economy, but had not created great problems of crowding or unemployment. Examples were:

Settlement on frontier as a help in developing the area
Contributions of Irish to our early transportation projects
Part played by German craftsmen in building consumer product industries.

Pre-Civil War America had a place for farmers from Northwestern Europe, attracted by free or inexpensive land.

The newer immigrants attracted by unskilled jobs in heavy industry or in sweatshops came from areas of greater hardships and were willing to accept poor working conditions, for example:

Landless situation of peasants in Eastern Europe
Plight of Jews in Russia and Poland, subject to religious and economic discrimination.
Overcrowded conditions in Italy, especially in Sicily, without the alleviating effect of industrial development
Completely different economic base in China, which made work on western railroads in the United States seem desirable

Cultural differences between these new groups and the groups already in America caused the various nationalities to settle in colonies in the industrial centers (failure of the melting pot theory).

The American workingman saw the immigrant as a competitor, keeping wages low and conditions unsatisfactory. This appeared in labor union endorsement of immigration restrictions such as the Chinese Exclusion Act.

The managerial group, however, pressured Congress effectively to prevent major limitations on European immigration until after World War I.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
11. Problems in assimilation of the immigrant population in late nineteenth century America stemmed from the vast numbers and the differences in cultural background of this group, as well as from their living conditions in the United States.	1. Immigrants faced many problems because of their differing cultural backgrounds.	1. Have the students identify and discuss the problems that the immigrant faced: (language, customs, religion, lack of skill, lack of education).	FILM: Story of an Immigrant (30 min.) Teaching film Custodians, 25 West 43rd St., New York, N.Y. 10036 (No. T-16)
	2. Immigrants generally found it necessary to take unskilled jobs.	2. Discussion question: a. What is discrimination? b. What groups in American society today suffer from discrimination? (e.g. Puerto Ricans, Spanish Americans, Indians, Negroes, etc.	
	3. Immigrants were gradually assimilated into American Society. In this sense they became acculturated.	3. Have immigrants visit the class (or have members of the class interview and record their interviews for class playing) to elicit the types of problems faced by these people during the last 50 years. Encourage the class to identify recent immigrants as well as those who came to America many years ago.	
	4. Ethnic customs and traditions are still reflections of the impact of immigration on American ways.		
	5. Discrimination faced by the immigrant is much like discrimination faced by minority groups in our society today.		

LESSON 12
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

DURING THE POST-CIVIL WAR PERIOD, THE AMOUNT OF MONEY AVAILABLE WAS INADEQUATE FOR THE RAPIDLY EXPANDING BUSINESS AND AGRICULTURAL ECONOMY.

More money in circulation results in:
- Increasing prices: helpful for farmers with products to sell, harder for consumers who must buy the products
- More money available for loans: helpful to farmers, who needed to buy land, farm machinery and equipment on credit; helpful to those wishing to expand business; undesirable for lenders because the rate of interest lowered as more capital became available
- More money available to repay loans
- Money not worth as much in buying power therefore the lender does not receive back as much purchasing power as he lent

Money in this period included:
- Gold and silver coins issued by the federal government
- Paper bills issued by the federal government which could be redeemed in gold or silver
- Paper bills issued by banks which could be redeemed in gold, silver, or government bonds
- Greenbacks or paper money issued by the federal government during the Civil War, with promise to pay later
- Credit: money in bank accounts, money which the bank or others are willing to lend

Some of the ways the amount of money in circulation can be increased are:
- The federal government's purchase of more gold or silver, with more paper bills redeemable in one of these metals
- The federal government's issuance of more paper bills not backed by metals (greenbacks)
- Increased bank credit

Some forces which tended to discourage the expansion of money and depress prices in this period included:
- Government intention to withdraw greenbacks from circulation
- No significant gold discoveries to increase coins or paper bill backing
- Reluctance of government to buy quantities of silver in period of enormous silver discoveries (Comstock Lode)
- Reluctance of creditors to permit an increase of money in circulation (political dominance of this group)
- Preference of banks to lend to businessmen (short term credit) rather than to farmers (long term credit)

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
12. During the post-Civil War period, the amount of money available was inadequate for the rapidly expanding business and agricultural economy.	1. The success of a business venture depends on available capitalization. 2. Man should determine his financial need in order to adequately support his family. 3. Work is important in helping an individual to meet his financial obligations. Man works to earn money.	1. Have the class (or individuals) identify and embark upon a business venture. Have participants in the project continually report on the necessity for capital investments (expansion, improvements, etc). The project can evolve from student interests in starting a business or a hobby (e.g. collecting stamps or any hobby where the investment can be equated with business orindustrial expansions). 2. Have the class discuss their own financial needs, how they meet these needs, the types of frustrations/dissatisfactions they encounter in trying to meet their own financial obligations, and the satisfactions they have experienced through work or the rewards of work.	

LESSON 13
ECONOMIC EXPANSION (1865 - 1900)
8th Grade

ALTHOUGH MOST OF THE POLICIES OF THE FEDERAL GOVERNMENT AND MUCH OF THE LEGISLATION PASSED BY CONGRESS TENDED TO HELP THE BUSINESSMAN RATHER THAN TO SOLVE THE PROBLEMS OF THE FARMER OR THE LABORER, THERE WAS PROGRESS BY THE GOVERNMENT TOWARD INSURING A MORE RESPONSIBLE ATTITUDE.

Progress toward more responsible government may be seen by the following:

The fight for Civil Service reform made more dramatic by the assassination of President Garfield

Grover Cleveland's public image, characterizing his statement, "A public office is a public trust"

Cleveland's fight for tariff reform

Passage of the first business regulatory legislation, the Interstate Commerce Act and the Sherman Antitrust Act.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
13. Although most of the policies of the federal government and much of the legislation passed byCongress tended to help the businessman rather than to solve the problems of the laborer, there was progress by the government toward insuring a more responsible attitude.	1. Government involvement in the economic affairs of the nation has increased steadily in the twentieth century.	1. Have members of the class investigate local occupations that are regulated, in part, by government regulatory agencies: a. Public Service Commission and public utilities b. FAA and commercial air industry c. ICC and transportation industry d. FCC and communications industry e. FTC and interstate trade regulation	See Appendices A and B for local jobs that can be used in this activity. Obtain occupational monographs of jobs in the Mid-Hudson area - available from the Mid-Hudson Career Development Center
	2. Government has become increasingly concerned with the regulatory aspects of business and labor.	2. Invite guest speakers representing one or more of these agencies to visit the class to discuss the nature of government involvement and the types of jobs that are created as a result of the government's intervention in these (or other) areas.	
	3. Workers as citizens must maintain a sense of civil responsibility both in their living and working community.	3. Develop a discussion centering on the student as a citizen in the school community and relate it to the worker in the work community.	
	4. Rights presuppose responsibilities. 5. There is a difference between rights and privileges.	4. Discuss student rights and responsibilities. Have students examine these and their feelings about them and relate the current states of student satisfaction/dissatisfaction to the affairs of student government. Have students plan ways	within the system of government available.

ASIAN AND AFRICAN CULTURE

9TH GRADE SOCIAL STUDIES.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
I. The Revolution of Rising Expectations			
1. There is a "Revolution of Rising Expectations" among the economically disadvantaged in the world.	1. There is a "Revolution of Rising Expectations" in the world of work. 2. Some people have an idealistic picture of work; others have a realistic one.	1. Have students compile information concerning the educational and vocational background of their family tree. Have them trace as many generations as possible.	Negro Views of America, AEP series, pp. 54-55
2. The "Revolution of Rising Expectations" contains elements of idealism.	3. An accurate picture of worker response to a job is rarely apparent.	2. Use the "Work Experience Questionnaire" to ascertain the variety of responses with regard to worker job satisfaction and dissatisfaction.	The "Work Experience Questionnaire" can be located at the end of this section.
a. Pan Africanism has been largely an ideal rather than a reality. (Pan Africanism has an economic advantage)	4. Mass media contribute to the distortion of jobs and job functions in the world of work.	3. Discuss TV serials that present views of an occupation or occupations. e. g. "The Bold Ones" (medicine, Law); "Room 222" (teaching); "Ironsides" (police force); "Mannix" (private detectives); "The Mod Squad" (police). Have students identify stereotypes, distortions, inaccuracies, etc. Have them relate this experience to sources of other work stereotypes.	
b. Hydroelectric plants and iron and steel factories are symbols of modernization in in underdeveloped countries.	5. Human dignity cannot be accorded when stereotypes dilute responses.		
c. Political independence brings economic independence.			

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
3. An unique example of realism would be the changes in Tanzania which came as a result of the education for self reliance. (EDUCATION FOR SELF-RELIANCE in 1967, THE ARUSHA DECLARATION to better meet their economic objectives, they have reorganized their educational system). The goals of the educational system were: a. to transform itself into a rural-directed institution whose products, especially from the primary schools, would ably and willingly contribute to rural development. b. to become integrated with and a servant of the communities in which it operated. c. to throw off the formal and substansive encumbrances of its colonial past.		3. Discussion Questions: a. How do the educational problems of Tanzania compare with those faced by the United States? b. What similar problems do we face in the United States? c. How is Tanzania eliminating the stigma of manual labor? d. How are they dealing with the misconception that education is a panacea? e. Is the Tanzanian government satisfying the aspirations of its citizens?	Rosnick, Jane and Rosnick, Idrian, "Tanzania educates for a new Society", Africa Report, January 1971, pp.26-29.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
4. One of the ways in which these goals are being implemented is a massive nation-wide adult education campaign. Community education centers are being built to serve the total education needs of the community. The government is providing economic and educational opportunities on the local rural level, thus preventing the needless movement of people to urban areas.		f. Can the United States deal with its problems in the same manner as Tanzania? Why or why not? What can the United States do?	
5. Julius Nyerere is one of the few leaders who has a realistic picture of the task of providing the means of achieving "RISING EXPECTATIONS" in a new nation.			

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
. The misconception that all of Africa is a jungle, whereas it is in truth, grasslands. b. The myth that all Africans are head hunters. c. The world's misconception that the streets of American are paved in gold. d. The misconception that all white people exploit black people.		4. Play records or have student in the class play (live) traditional and modern folksongs based upon significant social problems. They can be used to elicit emotional responses and to initiate group discussions of relevant issues in interpersonal and intergroup relationships.	Exploding the Myths of prejudice, Warren Schloat Productions.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
II. Women in World Cultures			
1. Recent changes in the status of women are inconsistent with the roles to which society has traditionally assigned them.	1. The realization that woman's place may not exclusively be in the home.	1. Use the "Work Experience Questionnaire" to ascertain the degree of female participation in the world of work.	Wolfe, Helen B., Women in the World of Work, The University of the State of New York, The State Education Department, Division of Research, Albany, New York, September, 1969.
2. Changes in the law codes which have given women greater equality with men include: a. Raising of minimum ages for marriage b. Female rights to hold property c. Right of divorce and claim to maintenance allowance. d. Outlawing of bigamy	2. Occupational training is as important to women as it is to men.	2. Conduct a class discussion on attitudes toward "working mothers". Have students examine their own feelings toward the role of women in modern life. 3. Have students arrange to debate the women's liberation movement. 4. Divide class in buzz groups to discuss parent attitudes and behaviors with regard to the changing role of women in world societies.	
3. Some educated women have been assuming leadership services in the 20th century. a. Madam Pandit, first woman president of U.N.General Assembly b. Selection of Indira Gandhi as Prime Minister of India	3. Twentieth century woman is becoming liberated.		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
c. Selection of Golda Meier as Prime Minister of Israel			
4. Increased lifespan has in fluenced the growing equality of women.	4. Technological advances have in fluenced the growing equality of women.		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
III. Work Traditions and Customs			
1. Tokugawa Japan's policy of isolation.	1. All countries have their traditions and customs.	1. Show the filmstrip "Japan" to examine Japanese customs and traditions.	"Japan", Warren Schloat Productions.
2. Tribalism vs. nationalism in Africa.	2. There is security in tradition.	2. Assign a research project on the traditions of one of the following groups	
3. Village-life vs. city-life in India.	3. People are afraid of what they do not understand.	a. Ibo, Yoruka, Fulani, Ashanti, Masai, Watutese, Kikuyu, Zulu, Amhara.	
4. In Southeast Asia the conflict between the people of the hills vs. people of the plains.	4. Some tradition is needed for the security of man.	b. In North Africa, the Berkers, Bedouins and Arabs.	
5. The role of women in Islamic communities.	5. Work roles are often guided by tradition	c. In the subcontinent of India, The East and West Pakistanis and the various religious groups.	
		d. In Southeast Asia, the hills people, the plains people and the various national groups.	
		e. In China, the various minority groups.	
		f. In Japan, the Ainu.	
		3. Play the opening number "Traditions" from Fiddler on the Roof. Have students discuss their own family traditions and customs.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		4. Have the students identify and discuss work roles and functions in all cultures that are bound by tradition, e.g. nurses are female, etc.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
IV. The Social Order and Societal Change. 1. Confucian China emphasized conformity. It was an ordered society; everyone knows and does what is expected of him. 2. The functions of state, structure of society, patterns of behavior and the goals of education all reflected conservatism, stability, and acceptance of established authority in place of change. 3. Education in China reinforced the authority of tradition: a. Confucian classics were memorized. b. Government eligibility examinations were based on mastery of the Chinese classics. c. Family status was raised by having sons trained as Confucian scholars.	1. In a changing society it is a difficult task to correctly perceive what institutions to discard and what new institutions to accept. 2. In most organizations, everyone knows and does what is expected of him. With such order, efficiency and security are benefits; flexibility and change, however, are more difficult to achieve. 3. Changing the social order is not always an easy task. 4. Modern methods of communication made rapid change a reality. 5. There are arbitrary standards which develop in any society.	1. Have students study the tightly ordered system of Confucian China. After the students have had an opportunity to study China, have them examine a number of the following noting similarities and differences: (1) small vs large companies, (2) government bureaucracies, (3) labor unions, (4) educational institutions, (5) other institutions such as the church. 2. Discuss the following statement by Dr. Sidney Marland, Jr., United States Commissioner of Education (as reported in the New York Times, August 8, 1971. "The notion that someone who goes to college is better than someone who does not go must be changed so that a first-rate artisan who works with his hands is held in as high esteem as the graduate of a liberal arts college". Bring out the values and traditions that undergird the current notion. Have students suggest ways of effecting the social change inherent in Marland's challenge to the nation.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
4. Post war Japan is an example of a nation that was able to change its economy very quickly. These economic changes have affected the mores and traditions of Japanese society. a. Post war changes in Japan (educational systems, woman suffrage, labor unions, political reforms). b. Emphasis on higher education with pressure for admission to the universities. c. Shortage of skilled labor in Japan. d. Automation in Japan.		3. Have students form buzz groups to compare and contrast the social order of Confucian China with post was Japan. 4. Discussion questions: a. What is change? b. How does change affect us? c. What changes in the American social order would you like to see? d. How can an individual work for change?	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
5. An institution can be an established practice.	1. An institution can be an established practice.	1. Discussion questions: a. What is an institution? b. What is a fad? c. What is an American institution? d. Describe an American fad.	
a. The institution of any society can be studied but perhaps can be most clearly seen in China, (e.g. Confucianism, the Chinese language, and Chinese ethnocentrism).	2. There is a decided distinction between a fad and an institution.	2. Discuss such statements as "Love America or leave it", "My country right or wrong" and relate these to institutions in American life.	
b. In our society, a current popular substitute institution is "establishment".		3. Have the students discuss the relationship between "institution" and "establishment" and the forces that either resist or encourage change in the social order. Have the students cite as many changes as possible in the American social order (e.g. thrift values in an order of planned obsolescence,etc.).	
c. Education is an institution. It has been cited as the one institution in American society most resistant to change.			

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
IV. Classifying Work and Work Functions in the Social Order. 1. Much of non-western history has not been recorded and is therefore misunderstood. 2. Objective study of non-western peoples is a new approach. 3. Classification of Africa's people is difficult. 4. Examples of western exploitation of Afro-Asian Societies have been exploited by Western world. a. the white man's burden b. propagation of the Christian faith c. slavery d. opium trade in China e. colonization f. unequal treaties in China g. white supremacy	1. Job analysis and classification is a relatively new approach. 2. Job classification is a way of giving order to the world of work. 3. Some people prefer to think of jobs in a hierarchical structure with professional jobs having highest status and menial jobs the lowest. 4. Jobs can be classified according to work area (data, people and things). 5. Every occupation creates its own language (jargon) which is a cause for confusion in the use of terminology. 6. Some people work with data or information (e.g. bookkeeper, cashier). 7. Data-oriented work functions include the following: synthesizing, coordinating, analyzing, compiling, computing, copying, comparing. 8. Some people work with people (e.g. salesman, store clerk). 9. People-oriented work functions include the following: mentoring, negotiating, instructing, supervising, diverting, persuading, speaking-signaling, serving.	1. Show how occupations have been traditionally classified with professional and managerial jobs at the top of the hierarchy and unskilled jobs with the lowest status. Introduce newest system for classifying occupations by groups and for coding all jobs by work function. 2. Have students bring in examples of technical language peculiar to occupational groups (e.g. Dictionary of Artisans and Sculptures, Medical Terms, Diderot Pictorial Encyclopedia of Trades and Industry, Livingstone's Dictionary for Nurses). Organize small work groups to draw up lists of technical terms and work jargon for various occupations.	Use D.O.T. (Volumes I and II).

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	10. Some people work with things (e.g. assembler, truck driver). 11. Things-oriented work functions include the following: setting-up, precision working, operating-controlling, driving-operating, manipulating, tending, feeding-offbearing, handling.		

A STATEMENT OF PURPOSE FOR THE WORK EXPERIENCE QUESTIONNAIRE

A common household criticsm of schools today is that students are not being adequately prepared for either the "real world" or the world of work. In short, education just isn't relevant. The cooperation and participation of the community-at-large as a resource would be most helpful in striving to improve the significance or meaningfulness of the educative process.

Who can qualify as a resource? Any person in the community who has been continually employed for a period of six months or more. It can be any member of your household, neighbor, friend or person willing to use their own personal work experience as resource information.

The resource information will be used hopefully to better attune students to the realities of the world of work. The questionnaire is aimed at obtaining views and attitudes toward work, based in the local community, and not upon the identities and/or personal lives of the contributors.

WORK EXPERIENCE QUESTIONNAIRE

Please Note:

You will find no place on this form for either your name or signature. It is designed to obtain work experience information on a wide scale without infringing on anyone's basic right to privacy.

1. Sex: __________ Female __________ Male

2. Age: ______ 18-25 ______ 26-40 ______ 41-55 ______ 56-70

3. Period of residence in Orange County:

   ________ Less than a year

   ________ 1-5 years

   ________ 6-10 years

   ________ more than 10 years

4. Do you work __________ full-time

   __________ part-time

   How many times has your career necessitated a change in residence from one community to another?

   ____

5. Title of your most recent job. ____________________

6. List the jobs which you have held in the past.

   ____________________ ____________________

   ____________________ ____________________

   ____________________ ____________________

WORK EXPERIENCE QUESTIONNAIRE - page 2

7. Do you work with

__________DATA ___________PEOPLE ___________THINGS

If your job involves a combination of the above work areas check those areas with which your work is involved and double check the one area with which it is most involved.

For example:

A shoe salesman works with __Data __People __Things.
A bookkeeper works with __Date __People __Things.
A machinest works with __Data __People __Things.

8. In which do you most prefer to work?

__________DATA; __________PEOPLE; __________THINGS

9. Which subject area or areas in school did you find most helpful in relation to your job?

____English
____Art
____Science
____Social Studies
____Physical Education
____Math
____Industrial Arts
____Music
____Foreign Language
____Home Ec.

10. Which subject area or areas in school did you find least helpful in relation to your job?

____English
____Art
____Science
____Social Studies
____Physical Education
____Math
____Industrial Arts
____Music
____Foreign Language
____Home Ec.

11. How would you describe your most recent job experience?

____extremely satisfying
____satisfying
____average - tolerable - a way to make a living
____dissatisfying
____extremely dissatisfying

WORK EXPERIENCE QUESTIONNAIRE - page 3

12. Do you think that your most recent job challenges your abilities and talents?

____always _____sometimes ____never

If your answer is never, are you planning to change your job?

____no ____yes (if yes, when?____________________________)

13. Which items have caused you the greatest amount of satisfaction in your total work experience?

____Recognition for a job well done
____Doing work which fits your nature
____High wages or salary
____Future job opportunity or advancement
____Good working conditions
____Cooperative fellow employees
____Reasonable superiors
____Working alone
____Job security and fringe benefits

14. Which items have caused you the greatest amount of dissatisfaction in your total work experience?

____Doing work which doesn't fit your nature
____Low wages or salary
____Poor working conditions
____Uncooperative fellow employees
____Unreasonable or unqualified superiors
____Working alone
____Prospect of losing your job at any time
____No or few fringe benefits
____No possibility of future opportunity or advancement
____Lack of recognition for a job well-done

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"SELF-EXPRESSION THROUGH SELF-KNOWLEDGE"

--ART AND VOCATIONAL AWARENESS

PREPARED BY:
ROBERT J. WALZ

INTRODUCTION

It is readily apparent from the nature of this document that the orientation of my comments on the middle school art program focus on these that concern "vocational development." There may be those of you whose first reactions will be somewhat akin to mine: "Oh, not again "or, "What mold are they now trying to force art into?"

Simple, and without trying to editorialize on the success or failure of "vocational guidance" or on the uses and abuses of art programs in the public schools, the material that follows has been prepared with the following statements in mind:

1. Activities contributing in some form to the vocational awareness of students is of importance in the public schools.
2. The art program by the nature of its commitment to the development of self-expressions through self-knowledge, lends itself readily to a program of vocational awareness.

It is my opinion that the primary objective or goal of a middle school art program -- of any educational program -- should be the guidance of the student toward the attainment of what psychologist Abraham H. Maslow calls "self-actualization" -- "the need to develop the full potentialities of a person"[1] -- to help the student become all that he or she is capable of becoming.

To achieve this goal of self-actualization, the student must first know something about his capabilities. What am I? What are those physiological and psychological "things" that make up the total me? In which things do I excel? In which of these things am I lacking? Can I improve them and if not, what are my options? These are questions which individuals can and should ask themselves. It is only through such a process of self-evaluation that a student, a person, a human being can come to know his or her "self." You can tell me that I am an excellent painter and this may satisfy me for a short period of time, but unless I soon know I am a good painter, I may remain uncertain, insecure and perhaps even an unhappy man at best.

It is my intention to show how an art program can aid the student to become more aware of his or her "self through self-evaluation. I also believe it will be evident that this "self" evaluation-through-art is succinctly interrelated with, and mutually nurturing to, vocational awareness. Further, there need be no vast changes in any existing art program -- only a new awareness and a different emphasis on the part of the teacher of art.

In the following pages I have listed some of the physiological and psychological traits or characteristics that are inherent to a greater or lesser degree in each of us as human beings. Along with each trait, I have listed and commented upon an art activity. Through this procedure it is my hope that the interrelationships of art, human traits and vocational awareness are more clearly seen. It is my feeling that it is the art teacher's role to guide the student, when and where necessary, toward a fuller understanding of these interrelationships. When the student does understand these relationships and how they apply to him, he has come that much closer to the goal of total self-knowledge. He is that much better able to self-actualize his being.

It is my intent, therefore, in the pages that follow to indicate some of the ways in which art can contribute to the vocational maturation of the student and how some of these goals can be more readily attained.

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[1] Clifford T. Morgan and Richard A. King, Introduction to Psychology, McGraw-Hill, Inc., New York, 1966, p. 494.

Worker and/or Work Situation Traits[3]	Comparative Art Activity	Comments
I. APTITUDES "Specific capabilities and abilities required in order to learn or perform adequately a task or job duty."[2] In this section I believe it is important (1) that the student understands that the listed traits are a part of each individual's total personality, (2) that the student, through art activities, evaluates himself in terms of these traits, and (3) that the teacher offers guidance where necessary in helping the student assimilate the first two concepts.		
1. Intelligence: General learning ability. The ability to "catch on" or understand. Ability to reason or to make judgments.	1. Linoleum cut process.	1. This activity involves several mental abilities that are of an abstract reasoning and/or mechanical reasoning character. Students come to grips with these concepts, for example: (1) what is removed from the linoleum block will not print while that which remains will print, and (2) what design is eventually cut into the block will in fact print out reversed or "mirrored". These are but two of the mental processes with which an individual must cope in this art activity. Through this and similar art activities, which present concepts of similar, higher, or lower complexity, the student is presented with the opportunity to experience facets of his total intellectual capacity.

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[2] Dictionary of Occupational Titles, Vol. II, U.S. Department of Labor, Washington, D. C., 1965, p. 653.

[3] D.O.T., p. 653.

Worker and/or Work Situation Traits	Comparative Art Activity	Comments
2. Verbal: Ability to understand meanings of words and ideas associated with them. To comprehend language, to understand relationships between words and to understand meanings of sentences and paragraphs.	2. Oral or written instructions given in relation to the many art activities (i.e., proper use of rubber cement, "clean-up" assignments, etc.).	2. These activities require a student to translate verbal or written instructions into concrete actions and thus provides her/him with the opportunity to examine his/her abilities in the area of verbal comprehension and understanding.
3. Numerical: Ability to perform arithmetic operations quickly and accurately.	3. Painting -- mixing colors.	3. Through this activity a student is made aware that the mixing of colors involves more than the mere combining of two colors (blue and yellow) to obtain a specifically desired third color (chartreuse). Rather, this process involves the use of mathematical proportions of a relatively precise nature.
4. Spatial: Ability to comprehend forms in space and understand relationships of plane and solid objects. May be used in such tasks as blueprint reading and solving geometry problems. Frequently described as the ability to "visualize" objects of two or more dimensions or to think visually of geometric forms.	4. Drawing: Basic "realistic" rendering of still-life composed of various forms (spheres, cubes, cylinders, pyramids) and shapes (circles, rectangles, squares).	4. In this activity the student is faced with the problem of rendering a drawing of two and three dimentional objects (shapes and forms of the still-life) on a two-dimentional surface (paper). To render a drawing so that it look "real" or "photographic" upon completion. The student must first be able to mentally visualize the differences between the forms and shapes and their special relationships to each other before he can mechanically reproduce them.

Worker and/or Work Situation Traits	Comparative Art Activity	Comments
5. Form perception: Ability to perceive pertinent details in objects or in pictorical or graphic material; to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.	5. Same activity as #4 -- rendering of still-life with basic geometric shapes.	5. After the student comprehends general spacial relationships, he is now faced with the problem of mechanical representation of these objects. Here he may be faced with the dilemma of pictorially representing, two or more identical forms (i.e., two cubes) with the same exact dimensions, one being slightly closer to him than the other. Again, to render these two objects "realistically" he must (1) be aware of a fundamental of basic perspective -- as an object recedes in space it becomes smaller, as it advances it becomes larger -- and (2) be able to apply this fundamental (i.e., he must draw the object which is farther away smaller than the object which is closer even though he knows both objects are identical in size). If, in fact, he has understood and applied these principles, he has also "perceived pertinent details in objects,...seen slight differences in shapes,...and widths and lengths of lines." With the introduction of further aspects of perspective, he may increase his understanding of, and skills in, dealing with problems which involve form perception.

Worker and/or Work Situation Traits	Comparative Art Activity	Comments
6. Motor coordination: Ability to coordinate eyes and hands or fingers rapidly and accurately and quickly.	6. Weaving with a loom.	6. In this activity eye, hand and finger coordination are necessary in the process of being able to manipulate the shuttle of weft thread through the shed of the warp thread. As the student gains a greater dexterity (motor coordination) in this or similar activities, he is able to proceed at a faster rate.
7. Finger Dexerity: Ability to move fingers and manipulate small objects with the fingers rapidly or accurately.	7. Toothpick sculpture	7. The student is faced with the task of manipulating each individual toothpick he adds to his sculptural form. The toothpick may have to be held at critical angles, to be maneuvered in confined spaces, and to be held in these positions for periods of time required for the glue to dry.
8. Manual Dexterity: Ability to move the hands easily and skillfully. To work with the hands in placing, and turning motions.	8. Use of jigsaw required in a project involving the cutting of wood forms or shapes.	8. Here the student must be able to accurately maneuver his piece of wood through the saw along the lines of the shape or form he has drawn on the wood. The more complex the design, the greater the dexerity required.
9. Eye-Hand-Foot Coordination: Ability to move the hand and foot coordinately with each other in accordance with visual stimuli.	9. "Pot Throwing" on potter's wheel.	9. In this activity the student must be able to coordinate the actions of the foot as it controls the speed at which the wheel rotates with the hands and the eyes as they shape and mold the clay into the desired form.

Worker and/or Work Situation Traits	Comparative Art Activity	Comments
10. Color Discrimination: Ability to perceive or recognize similarities or differences in colors or in shades or other values of the same color; to identify a particular color, or to recognize harmonious or contrasting color combinations, or to match colors accurately.	10. Tempra Painting Unit	10. In this unit, the student is presented with different problems in terms of color relationships through experimentation with each class. In the first class he may be presented with only two "colors"-- black and white -- and be encouraged to experiment with as many shades and values of these as time and interest allow. Next, he may find himself exposed to the "hot" or 'Warm" colors -- red, yellow, orange -- plus the original black and white and again be encouraged to experiment with the values of these colors as well as recognizing their harmonious relationships. The "cold" or "cool" colors -- blue, green, purple -- may be introduced the third day. At the next class meeting the student may find himself exposed to a "full palette" for experimentation in which he may realize the potential of contrasting colors in painting.

Worker and/or Work Situation Traits[5]	Comparative Art Activity	Comments
II. TEMPERAMENTS "Different types of occupational situations to which workers must adjust."[4] In this section, I have tried to show how art activities provide situations which allow a student to (1) experience a variety of temperaments and work situation and (2) evaluate his performance in relation to these situations and temperaments.		
1. Situations involving a variety of duties, often characterized by frequent change.	1. Etching process in general	1. Etching involves a variety of processes from the initial conception of the design to be etched to the preparation of the plate (the covering of the plate with a wax mixture, the exposure of the design on the plate with a needle point, the acid bath which etches the design, into the plate and the removal of the wax) to the inking and "wiping" of the plate to the paper preparation, to the printing process of running the plate and paper through the press.

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[4] D.O.T., p. 654.

[5] Ibid.

Worker and/or Work Situation Traits	Comparative Art Activity	Comments
2. Situations involving a repetitive or short cycle operations carried out according to set procedures or sequences.	2. Etching process - inking plate and printing	2. A facet of the etching process that is relatively routine or repetitive in nature is the printing process. For each print that is desired the student must repeatedly ink and wipe the plate, dampen the paper, run them through the press and "hang" them to dry.
3. Situations involving doing things only under specific instructions, allowing little or no room for independent action or judgment in working out job problems.	3. Architecture - mechanical drawing of a building facade.	3. This art activity, when presented with little or no room for any personal, creative expression (he is given all specifications of the building, how it will be placed on the paper, what tools and materials he will use, etc.) forces the student in the situation of performing in a highly structured work condition.
4. Situations involving direction control and planning of an entire activity or activities of others.	4. Electography (TV - Video Tape) assigned role of Director of Production	4. The role of Director involves such duties as giving instructions to cast and crew, determining how script is to be interpreted, deciding how the light, scenery, and cameras are to be arranted, etc. The Director must have the knowledge and direction of where the production is "going". Therefore, he must plan for the entire activity and for each work role in it.
5. Situations involving the necessity of dealing with people in actual job duties beyond giving and receiving instruction.	5. Fashion Design	5. While art activities often require that an individual work independently, there are increasing career situations where the worker is a member of a team or of a cooperative effort.

Worker and/or Work Situation Traits	Comparative Art Activity	Comments
		5. (cont'd.) Assuming a team role in these activities also involves the dealing with the attitudes, interest and temperaments of others in the group in order that her/ his ideas may be more readily and harmoniously accepted by the group.
6. Situations involving working alone and apart in physical isolation from others, although the activity may be integrated with that of others.	6. Sculpture - group project - relief mural for enhancement of school entryway.	6. This involves the breaking up of the total mural into parts for each group in the class to complete and further may involve the reduction of the group member assignments wherein each student works on his assigned section of the total mural.
7. Situations involving influencing people in their opinions, attitudes or judgment about ideas or things.	7. Photography - group project - assignment: each group to come up with a series of photographs depicting a "feeling" such as love, hate, etc.	7. This activity provides the opportunity for an individual (or individuals) within each group to assume a membership role which might be of significant influence in deciding what feeling to depict and how this feeling will be portrayed, what will be photographed, how it will be photographed (light conditions, camera angles, etc.) and what format will be used in its public presentation.
8. Situations involving performing adequately under stress when confronted with the critical, unexpected or when taking risks.	8. Design a box for a tube of toothpaste - short time limit.	8. In this activity the student is presented with the commercial art problem of redesigning and constructing a box for a "name" brand. (e.g. toothpaste). He is reminded that neatness, easy read-ability, and "consumer appeal" are of great importance. A specific time limit of a relatively short period is placed on the project to stimulate working for a commercial firm.

Worker and/or Work Situation Traits	Comparative Art Activity	Comments
9. Situations involving the evaluation (arriving at generalizations, judgments or decisions) of information against sensory or judgmental criteria.	9. Student - evaluation/critique of project - such as listed in Nos. 7 or 10 of this section.	9. The student is placed in the situation where he must arrive at a decision concerning the relative success or failure of of his project in terms of whether or not it aptly rendered the "feeling" of prejudice or the "sensations" of love or hate, etc. He must further decide whether the drawing, painting, or photograph has successfully used the elements and principles of "good" design (line, color, texture, form, balance, rhythm, proportion, etc.) that are "pleasing to the eye.
10. Situations involving the evaluation (arriving at generalizations, judgments, or decisions) of information against measureable or verified criteria.	10. Student evaluation/critique of lettering project, where precise standards have been set.	10. The student must evaluate himself in terms of whether or not all letters are of the same height, width, have equal space between them, all words are equally spaced and are on equally spaced lines, etc.
11. Situations involving the interpretation of feelings, ideas or facts in terms of personal viewpoints.	11. Drawing or painting -- assignment: render a drawing or painting giving your interpretation of the concept of "prejudice."	11. In this activity, the student must first come to terms of what the concept of prejudice means to him before he can give thought as to how best to render this idea on canvas or paper with the tools available (chalk, charcoal, conte crayons, oils, acrylic, etc.).
12. Situation involving the precise attainment of set limits, tolerances or standards.	12. Plaster casting	12. The mixing of plaster places the student in a situation where he discovers that if he mixes too little or too much water, the resulting blend will be unusuable.

Worker and/or Work Situation Traits[7]	Comparative Art Activity	Comments
III. INTERESTS "Preferences for certain types of work or experiences, with accompanying rejections of contrary types of activities or experiences. Five pairs of interest factors are provided so that a positive preference for one factor or a pair also implies rejection of the other factor of that pair."[6] I believe it of importance to note that the situations below are not "either-or" situation. Rather, they can be viewed as a continuum on which an individual can evaluate his preferences and place himself.		
A 1. Situations involving a preference for dealing with things or objects. vs 6. Situations involving a preference for activities concerned with people and the communication of ideas.	A Film making project where each student has the opportunity to try out different positions in the film crew.	A This activity gives the student the opportunity to try position of Director of Production wherein he must give instructions to the cast and crew, as well as explaining to the cast how he would like the script interpreted. On the other hand, he can experience being a cameraman with the operation of equipment or things(e.g. move camera and its facets, angle, lighting, position, etc.).

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[6] Ibid.

[7] Ibid.

Worker and/or Work Situation Traits	Comparative Art Activity	Comments
B 2. Situations involving a preference for activities involving business contacts with people. vs 7. Situations involving a preference for activities of a scientific or technical nature.	B Silkscreen - The production of a school calendar.	B In this activity, the student may be given the opportunity to experience the situations of selling the school calendar, which involves a social, person-to-person contact with individuals with the intent of influencing these people to purchase a product; or that situation wherein he is directly involved in the production of the calendar - i.e., the registration of the different color stencils to be used.
C 4. Situations involving a preference for working for people for their presumed good, as in the social welfare sense, or for dealing with people and language in a social situation vs 9. Situations involving a preference for activities that are non-social in nature, and are carried on in relation to processes, machines, and techniques.	D Many times individual students finish their project or activity before the time alloted has elapsed. How does the student spend this time?	D Given these situations, the student may prefer to aid other students who are having difficulty completing their assignment for various reasons (lack of ideas, inability to handle materials, etc.) or he may prefer a situation that involves little contact with people (cleaning room, rearranging or "straitening" art supplies, etc.)
E 5. Situations involving a preference for activities resulting in prestige or the esteem of others. vs Situations involving a preference for activities resulting in tangible, productive satisfaction.	E Group vs Individualized Art Activities.	E During the student's exposure to the art program, he has hopefully been involved in various group and individual activities. Through this exposure it is hoped that the student has faced the situation such as a group activity wherein there was no opportunity for individual recognition and only the effort of the group was judged as being of worth. It is also hoped that there have been those individual activities wherein the potential for individual recognition has presented itself.

AFTERWORD

As a post-script to this document, I wish to offer the following thoughts:

(1) It is not, nor was it meant to be an all-inclusive statement on art and its relationships to vocational awareness. It is hopefully a beginning and not an "end" in any sense.

(2) It does not in any way imply that the art program should be subjugated to a subservient role in a total school program, on the contrary, I believe its base has been broadened.

(3) It may also serve as an aid in those "politico-economico-educational" situations where the value of an art program must be defended before the questions of principals, superintendents, school boards and/or the general public.

VOCATIONAL MATURATION:
A NEW APPROACH TO THE DEVELOPMENT OF LIFE SKILLS IN HOME ECONOMICS

Prepared by:

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Preface

Americans today are becoming increasingly aware of a return to fundamental values in our society; among them, being honest and sincere in our relationships with people, recognizing the inherent worth of the human being, and being concerned with the progress and protection of our society and environment.

The home economics field can be a distinct part of this return to creativity and concern with day-to-day living. Home economics should be considered for its contributions in this regard. Therefore, it will be referred to as a "life skills" field in the sense that it helps to make students aware of the on-going processes related to living, creative growth, and awareness of self.

Statement of Purpose

The ultimate goal of the vocational education area is to provide the youngster with skills for the world of work. The authors of this section have added to this goal by also stressing the world of living. The approach taken by the authors in the curriculum of industrial arts-home economics areas (life skills areas) will hopefully attain this outcome.

It is hoped that the life skills areas through the curriculum presented, will be elevated to the importance deserved within the educational continuum. It is a fact that often students will choose or are placed in this area because they cannot function or may doubt their ability to function successfully in a formal classroom setting. Conversely, those who overlook this field of study might do so because of the present societal pressures emphasizing the academic nature of higher education in the more traditional sense.

To assist the youngster in developing life skills to his fullest potential while concurrently attaining a level of vocational maturity has been the main concern in the preparation of these materials. Basically this growth can be fostered by introducing life skills experiences and attitudes in the elementary grades. Continual refinement and clarification should be a sequential and progressive part of the total educative experience.

It is hoped that in the following presentation, one will preceive the life skills areas in a different light. If this is accomplished, then it is possible that more students will avail themselves of study in these areas. It is hoped that this new approach to the development of life skills will provide some direction and guidance for the student who may not know where he is headed. Above all, we believe these ideas, if implemented in the home economics - industrial arts classroom, will contribute to a very important task of education for the early adolescent - that of helping him to achieve a measure of self identity.

The authors recommend that educators, parents, community and industrial leaders become knowledgeable and involved in the curriculum of the life skills. We believe that the material suggested can be a useful guide for the early secondary school teacher of the life skills. Lastly, the suggestions in this new approach are not a panacea; they are only a beginning.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Why are the industrial arts and home economics subject areas referred to as "life skills"? DEFINITION: Life skills are the learnings necessary for the individual to interact with his environment (both in a positive and negative sense).	1. The life skills take into account all of the human senses.	1. Bring to class several types of fabrics and be prepared to discuss why or why not you would use each for varying purposes.	Filmstrips: "What is Your Future in the Changing World of Work?" Eyegate, 1971. "Preparing for the World of Work". Guidance Associates, 1970. "An Overview of Technical Education" Guidance Associates, 1970. "Mid-Hudson Area Occupational Monographs" (See Appendices A and B) Mid-Hudson Career Development and Information Center, Beacon, New York
	2. Life skills are concerned with intelligent consumer choices.	2. Set up a display of several of the same product, each made from different materials; (e.g. handbags - made from leather, plastic, synthetics, string). Ask students why they would choose one handbag over another.	
	3. Life skills provide unique experiences in the development of safety habits.	3. Construct a bulletin board showing safe and unsafe life skills procedures.	
	4. Development of life skills is a sequential process.	4. Construct a flow chart showing steps involved in the simple tune-up of an automobile. Discuss sequential steps involved.	
	5. Life skills contribute to employability.	5. Show pictures to class showing men and women engaging in various occupations. Ask students to explain what they see.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		6. Set up a display table of various materials (e.g. tools, plastics, paints, etc.). Ask students how these materials are related to the world of work.	
		7. Mimeograph and distribute some job descriptions from Mid-Hudson Occupational Monograph. Discuss how students can prepare themselves for these jobs today.	See Appendices A and B

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
What is work? DEFINITION: Physical and/or mental expenditure of energy in the production of a good or service. Work involves the application of learned skills.	1. There are many types of work: 0-1-Professional, technical and managerial occupations 2-Clerical and sales occupations 3-Service occupations 4-Farming, fishery, prestige occupations 5-Processing occupations 6-Machine trades occupations 7-Bench work occupations 8-Structural work occupations 9-Miscellaneous occupations	1. Organize role-playing with students to portray one occupation within each of the 0-9 groupings.	Job Family Booklets SRA "Vocational Guidance Models: A Review" - N.Y.S. Education Department, Bureau of Guidance. You Can Work in the Education Services by Betty Dietz, John Day Co., 1968. "Work Efficiency - How to Control Fatigue" - Compton's Encyclopedia Vol. 24. Help Wanted: Female The Young Woman's Guide to Job Hunting. King, Alice G. - Scribner, 1968. In selecting occupations, or in having students select occupations, teachers may wish to refer to those found in the Mid-Hudson area. See Appendices A and B.
	2. Various types of work demand various levels of preparation. 2a Work and job requirements are constantly in a state of flux.	2. Choose 3 varying occupations (e.g., nurse, clerical worker and welder). Show what specific vocational preparation is required for each (see DOT, Appendix A, pg. 652)	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	3. Work results in societal stratification.	3. Have each class member represent a different occupation. Each student would then discuss with what occupational group he would like to be associated with and reasons why (economic sociogram).	
	4. Each type of work contains its own inherent worth.	4. Ask the school secretary to discuss her role in terms of contributing to the efficient school operation.	
		5. Get an idea of different types of work by visiting local industries - factory, service, managerial, technical. Classroom discussion to follow regarding types of work seen.	Also see Appendices A and B

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Why do people work? People work to satisfy individual needs and wants.	1. People work to satisfy economic needs. a. basic needs b. wants beyond needs c. long-term individual and family planning.	1. Ask class to imagine that family breadwinnner(s) suddenly becomes unemployed. What effect would this have upon your family as a whole? Upon yourself as an individual?	Record: "A Man's Work" (50 records). McGraw-Hill, 1971. Filmstrip: "Why Do People Work?" Visual Ed. Consul. Inc., Madison, Wis. Occupational Video Tapes, Mid-Hudson Career Development & Information Center, Beacon, N.Y. Film: "How We Make a Living". U. S. Bureau of the Census. Occupational Information in the Elementary School, W. Norris. SRA Association, 1969. Occupational Information Robert Hoppock. McGraw-Hill, 1967.
	2. People work to satisfy society's needs. a. improvement of society b. day-to-day operation of the economy c. providing of goods and services	2. Choose one occupational cluster (e. g. health services) and make a blackboard list of all occupations within that cluster. Have students do research into one of the specific occupations and then explain to class its relevance to the entire cluster. (See Appendix B)	
	3. People work to satisfy psychological needs (enhancement of self-concept). a. spirit of adventure b. prestige-self-esteem	3. Ask parent involved in hazardous occupation (e.g., steeplejack, stock car driver) to speak to class as to reason why he chose this field.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	4. Needs influence occupational choices.	4. Ask student who works after school or during summer to speak to class as to his reasons for working with attempt to show that there are reasons other than economic for working. 5. Have class imagine a society in which no one worked. Discuss implications-socially, economically, personally.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
What are current attitudes toward work? a. by students b. by students' parents c. by employers d. by labor unions e. by various levels of government f. by schools	1. Some of today's students feel traditional occupations are meaningless.	1. Present traditional and current (commune, "return to the earth") work concepts. Discussion of relative worth of each by class.	The Greening of American, Charles A. Reich, H. Wolff, 1970. Future Shock by Alvin Toffler, Bantam, 1971. "Credentials and Common Sense: Jobs for People Without Diplomas". Manpower Report U.S. Dept. of Labor, Dec. 1968. Filmstrip: "Getting and Keeping Your First Job". Guidance Associates, 1971. Speakers Bureau: Mid-Hudson Career Development Center, Beacon, N.Y. Publications from N.Y.S. Bureau of Appretice Training.
	2. Familial influence in assisting students to choose an occupation is lessening.		
	3. Technological changes have brought about a minimizing of physical abilities and maximizing of mental processes and creative abilities. a. There is stress today in the world of work upon various aptitudes related to technological change: intelligence, verbal, spatial understandings. b. There is less stress upon physical demands such as lifting, pulling, carrying activities.	3. Visit the school Data Processing Center to demonstrate concept #3.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	4. There has been a resurgence of craftsmanship in the American society within the last five years.		
	5. Employers are looking for increased productivity in return for higher wages and more employee benefits.	5. Lecture by local management and labor union leader as to role of business and labor in life skills area. (new trends in both management and labor; e.g., concept of accountability cost-reduction procedures, increasing production, 4-day, 40-hour work week.)	
	6. There is an increasing concern for ecological implications on the part of employer and employee.		
	7. Unions are becoming increasingly concerned about job security for their members.		
	8. There is much mobility within various occupational fields.	8. Secure resource speakers who have been mobile within their occupational fields.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	9. Economic factors are responsible for cutbacks in government jobs today. Job security in government jobs is becoming less prevelant.		
	10. Schools are becoming increasingly concerned about the dissemination of occupational information.	10. Ask school guidance counselor to speak with life skills classes regarding sources of occupational information in guidance office.	See Appendices A and B

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
How can an early secondary student prepare himself today (in a general sense) for the world of work. Through the life skills?	1. A student should be aware of the "self" in relation to the environment.	1. Have students fill out or make up a job application. (Use N.Y.S.E.S. Application forms)	N.Y.S. Employment Service. Employment Data Applications "Women in the World of Work". N.Y.S. State Education Dept. Division of Research, 1969.
	2. Students should be aware that education is an on-going, life process.	2. Have college-bound high school students visit class to become aware of career opportunities available in the life skills.	Career Choices for the 70's, A. Arnold. Crowell-Collier Press, N.Y., 1971. Filmstrips: "Preparing for the World of Work". Guidance Associates, 1971.
	3. An awareness of life skills is essential for occupational success.	3. Conduct a field trip to a local BOCES center.	"Preparing for Jobs of the 70's". Guidance Associates, 1971. "If You're Not Going to College". Guidance Associates, 1971.
	4. A role in student government sometimes provides a background for sound occupation choice. (e.g. acceptance of authority; sharing of responsibilities).	4. Observe a Student Government Association in action. Discussion of concepts observed (e.g. leadership roles; delegation of duties).	
	5. Maintenance of sound physical and mental health is essential for participation in the world of work.	5. Have the school nurse talk with life skills classes on health and safety considerations.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
What are the educational opportunities available after junior high school in the life skills? a. high school b. college (4 years, 2 years, and certificate programs) c. continuing education d. on the job training e. apprenticeship f. drop-out programs (JOBS, NEGRO, Harlem Prep, Job Corps) g. In-plant training	1. There are high school courses available in the further development of life skills.	1. Visit BOCES Center to help in possible occupational choices through selection of school vocational sequences.	Zapolean, M. W. Occupational Planning for Women. Harper & Bros, New York, 1961. Contact NYSES job counselor for Job Corps information. Kaplan Max. Leisure in America: A Social Inquiry N.Y. Wiley, 1960. "Work Together for Youth" - N.Y.S. Dept. of Labor, Division of Employment. Filmstrips: "No Limit to Learning" College Entrance Examination Board, 1964 " Career Programs in Two-Year Colleges" N.Y.S. Education Dept., Bureau of Occupational Education Research, 1970.
	2. There are available degree (2 years) and non-degree (1 year or less) programs in S.U.N.Y. colleges for pursuing post-high school education in life skill areas.	2. Ask an admissions representative from a State University of New York community or agricultural and technical college to speak to life skills classes explaining these programs.	
	3. N.Y.S. Dept. of Labor and labor unions sponsor and administer varying apprenticeship programs.	3. Ask member of Apprenticeship Bureau to speak to large group of 7, 8, 9th graders.	
	4. Job Corps opportunities are available for high school and junior high drop-outs.	4. Ask Job Corps counselor from NYSES to speak with potential dropouts as identified by counselor in life skills classes.	
	5. Interest activities can lead to occupational choices.	5. Show pictures of people involved in various leisure time activities. Discuss ways in which these activities can help	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		in making an occupational choice.	
		6. Take D.O.T. worker traits (training time, aptitudes, interests, temperaments, physical demands, and working conditions) and have student relate them to various levels of preparation for different occupations using qualifications profile.	Duplications of various job descriptions from D.O.T. (See School guidance counselor). Use occupations suggested in Appendices A & B

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
How are occupations structured within the life skills area? 1-D.O.T. Occupational Group Arrangement: 0-1-Professional, technical, managerial occupations 2-Clerical and sales occupations 3-Service occupations 4-Farming, fishery, forestry 5-Processing 6-Machine trades 7-Bench work 8-Structural 9-Miscellaneous Jobs are groups according to a combination of work fields, purpose, material, product, subject matter, service, generic term and/or industry.	1. There are many levels of entry occupations within the life skills.	1. Ask representative from Central Hudson Gas and Electric Corporation to speak to life skills classes regarding entry occupations in his company.	Local community colleges D.O.T. Apprenticeship Bureau Member Labor Union Leader Jobs to Take You Places Here and Abroad, Adrian A. Paradis McKay Co., 1968. "Evaluation of Secondary School Programs to prepare students for wage earning in occupations related to Home Economics" - N.Y.S. Education Dept., Bureau of Occupational Educational Research, 1968. In selecting occupational groupings, see Appendices A and B.
	2. Occupations are grouped into nine main categories (see content).	2. Mimeo 9 occupational groupings individually on separate sheets of paper. Pass around at random and have students identify jobs within individual grouping.	
	3. The life skills are involved in all of the nine occupational categories.	3. List the nine occupational groupings on a blackboard. Ask students to choose an occupation within the life skills area and relate it to as many groupings as they can.	
	4. The occupational groupings differ with regard to skills, education and training.	4. Have students choose an occupation within the life skills and construct a flow chart showing preparation for	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		entry in regard to: a. skills b. education c. training	
	5. The changing nature of occupations leads to a need for greater individual flexibility.	5. Have students role play to depict reasons why a physicist is unemployed today.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
ow is self-evaluation important to the development f life skills?	1. Knowledge of individual skills can indicate to students a potential work field.	1. Prepare self-evaluation sheets and/or progress charts in life skills classes so that students can evaluate themselves.	Strong Interest Inventory SRA Interest Inventory Kuder Interest Inventory Filmstrip: "Foundations for Occupational Planning" Singer/SVE, Chicago, Ill., 1971. The Seventeen Guide to Knowing Yourself, D. A. Sugarman & R. Hockstein Macmillan, 1967. Filmstrips: "Who Are You?" "What Do You Like To Do?" Singer/SVE, 1971.
		1. Prepare a series of thought provoking interest statements to which students respond positively or negatively.	
	2. Self-analysis regarding the following will assist in decision-making about occupational choices within the world of work: a. temperament b. aptitudes c. interests d. training time e. physical demands f. working conditions	2. Distribute D.O.T. job descriptions of dietician and tool-and-die maker. Ask students if they feel they would be happy in these positions giving reasons why or why not.	
		2. At conclusion of work session or project in life skills class, ask students how they felt working within teacher-classroom guidelines. Compare these feelings with an actual job experience.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	3. The school experience contains many elements that are common to the work experience.	3. Assign students to various responsibilities necessary for the efficient operation of the life skills class. Relate class responsibilities to similar ones that would be present on the job. Invite students from high school life skills classes to speak about reasons for their choice and future goals. Encourage life skills students to attend Career Night and College Night activities. Have students interview local businessmen as to their reasons for entering their particular occupational field. Report to class and have students express preferences or dislikes for possibly entering the occupational area concerned.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Why are interpersonal relationships significant in the classroom setting? ...and in the world of work?	1. The life skills lend themselves to a spirit of cooperativeness and creativity in the classroom.	1. Use the foremanship system for cooperativeness in environmental maintenance (ie: clean-up activities).	Filmstrips: "Dropping Out - A Road to Nowhere" Parts I & II, Guidance Association. "Your Personality: The You Others Know" Guidance Association, Pleasantville, New York. Film: "It's Your Move: Decisions for Discussion" Coronet Films, 1970. Filmstrip: "Life Issues" Series by Singer/SVE, 1971.
	2. Skills taught in the life skills area often carry over to the world of work.	2. Conduct a field trip to local industries (Star Expansion, GAF, Interstate Bag) to observe learned life skills in operation. A trip to a local dress factory. 2. Have owner of local automotive business visit industrial arts classes to discuss job functions and skills of his mechanics; school dietician to home economics class.	
	3. Interpersonal relationships developed in the life skills carry over to the world of work. a. pupil-pupil worker-worker b. pupil-teacher employee-employer	3. Have students role play using employee-employer concept. Have the players and the class discuss their feelings and any concepts gleaned from skit.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	c. pupil-student government worker-union		
	d. student government-school union-management		
	4. Life skills occupations involve adjustment to varying temperaments: e.g. situations involved with:	4. Visit to automotive or cosmetic plant to observe assembly-line procedures. Stress awareness of dependence of workers upon each other and upon their individual efforts.	
	a. direction, control, and planning of an entire activity		
	b. dealing with people in job duties beyond giving and receiving instruction	4. Have guidance counselor visit life skills classes to discuss importance of cooperation.	
	c. influencing people in opinions, attitudes or judgments about ideas or things.		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
What is the function of education for recreation in the life skills? e.g. a. needle-craft b. woodworking c. home-maintenance	1. Recreation is a significant part of the American life style today.	1. Make a list of life-skill activities pursued during after-school and after-work hours; during vacation periods.	How to Make Something From Nothing Ruth A. Egge. G. P. Putnam's Sons, 1968. Filmstrip: "Leisure" (show and describe the purpose and value of leisure time). Singer/SVE, 1971. Complete Book of Needlework and Embroidery, W. Butler. G. P. Putnam's Sons, 1967. Meaning in Crafts by E.L. Mattil, Prentice-Hall, 1965.
	2. Acquired knowledge of the use of tools is beneficial in the pursuit of hobbies or avocations for leisure or nonemployed time.	2. Make a collage using materials leftover from a project (see art teacher for ideas.) 2. Students bring to class and discuss and/or demonstrate various hobbies.	
	3. Vocational endeavors may be an outgrowth of avocational pursuits.	3. Invite a recreational activity college major to class to discuss recreation as an occupational field.	
	4. Leisure time pursuits may be more gratifying than work.	4. Show filmstrip "Leisure". Discuss purpose and value of leisure time today.	
	5. The world of work is moving toward a 4-day, 40-hour work week.	5. Discuss implications of 4-day, 40-hour work week; i.e. how man will use increasing amount of nonemployed time in coming years.	

B. LIFE SKILLS IN THE HOME ECONOMICS CLASSROOM

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
1. How does food make a difference in how a person: a. looks b. grows and develops c. feels and reacts d. works and performs 1. In relation to the various physical demands made upon the worker. 2. Impact on work functions.	1. Nutritional intake affects height, weight, skin condition. a. A person analyzes proper food selection for his physical well being.	1a. Compile a list of nutritional snacks selected by various class members. Do a bulletin board on the five nutrients. Conduct a panel discussion of common teenage problems resulting from improper food selection e.g. overweight, underweight, dull hair, skin problems.	The Great Nutrition Puzzle, Callahan and Payne. Charles Scribner Sons, 1956. Understanding Food, Tannerbaum and Stillman. McGraw-Hill Book Co., Inc., 1962. The Miracle of Vitamins, Doris Farber. G. P. Putnam's Sons, 1964. What We Eat, Lois Johnson, Rand McNally and Co., 1969. Food Facts for Young People, Arnold and White. Holiday House, Inc., 1968. How You Plan and Prepare Meals, Carson and Ramee. McGraw-Hill Book Co., 1962. "Right Eating Keeps You Swinging" (booklet). Carnation Co. "Food and Nutrition Series" filmstrips, McGraw-Hill Co. Mid-Hudson Area Occupational Monographs.
	b. A person compares the benefit of nutrients for development of good food habits evolves.	1b. Have class keep a 3-day log of all foods eaten and compare with the basic four food guide.	
	c. A person interprets the nutritional facts in terms of his personal eating habits.	1c. Demonstrate various ways of cooking fruits, vegetables, etc. for highest vitamin retention. Invite school dietician to discuss the balanced school lunch.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
1. How does the preparation and serving of food relate to personal development?	1. The application of common sense is important in the preparation and serving of foods.	1. Plan and use time schedules when doing various activities where time is a major factor.	Teen Cuisine, Kirsch and Klein. Parents Magazine Press, 1969. How You Plan and Prepare Meals, Carson and Ramee, McGraw-Hill Book Co. 1962.
		1. Invite visitors to a luncheon planned and prepared by students.	"Cakes" filmstrip, Betty Crocker, General Mills, Inc.
2. What are some aptitudes necessary for the proper preparation of food? a. Numerical b. Verbal c. Color Discrimination d. Manual Dexterity	2. Proper arithmetic functions, in food measurements, mainly numerical, lead to successful outcomes.	2. Plan an experience to show how improper measuring can lead to failure. Ex. Cakes will not rise if baking powder measurement is inaccurate.	"Serving Foods Attractively" Cooking Series Filmstrip McGraw-Hill Co. Festive Food Decoration, Sheila Ostrander, Sterling Publishing Co. Inc. 1969.
3. What temperaments are involved in the preparation of food? a. Following specific instructions. b. Planning and control.	3. Food preparation depends on the ability to understand both written and verbal instructions.	3. Plan an experience to allow students to work from a cookbook.	Better Homes and Gardens Jiffy Cooking Cookbook BH and G., 1967. Betty Crocker's Cookbook Golden Press Western Publishing, 1969.
	4. Color discrimnation is important to the enjoyment of a meal.	4. Show filmstrip "Mealtime Can be Magic" which highlights color, texture, form as related to food preparation.	"Mealtime Can Be Magic" General Mills Co.
	5. Manual dexterity is necessary to the preparation of a food.	5. Demonstrate all all new techniques involved in food preparation (e.g. kneading, rolling, shaping.)	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	6. Many recipes demand the following of specific instructions.	6. Have students compile a classroom recipe book of foods they have prepared.	
	7. Direction, control and planning are required for the completion of an entire meal.	7. Have students research, plan and prepare a foreign meal. Plan different ways to serve a familiar food (i.e. biscuits for breakfast, desserts, luncheons).	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
1. How can the interpersonal relationship of family members contribute to a student's self-development? a. family composition, (roles of family members) b. responsibilities within the family c. problem-solving within family setting.	1. Many people-oriented functions can be employed in dealing with and understanding the interpersonal relationships of a family group.	1. Make a bulletin board exhibiting family pictures engaged in various activities. Try to find pictures that will portray various functions in interrelating processes.	Teen Guide to Homemaking, Barclay and Champion. McGraw Hill Book Co., 1961.
The people-oriented work functions of negotiating, persuading and serving, are defined in the D.O.T., Volume II, p. 650.	a. Negotiation leads to family problem-solving techniques.	a. Form buzz groups – students identify a variety of typical family problems, ask them to ascertain how negotiation could be employed in resolving these problems.	"Appreciating Our Parents". (film) Coronet Instructional Films, 1971.
	b. Persuasion can result in acceptance of views of others in family setting.	b. Discuss common causes for misunderstanding in the family and appoint an "expert panel" to solve problems in the class.	
	c. Apply common sense techniques or understandings to carry out simple/complex instructions.	1c&d Invite a minister or social worker to class to discuss the importance of good family relationships.	Speakers Bureau, Mid-Hudson Career Development and Information Center.
	d. The ability to reason and make judgments leads to harmonious family relationships.		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	e. Family members give service to others who demand immediate attention.	1e Have the class draw up a list of family situations when the work function-serving- is essential for a family member's welfare.	"Awareness: Insight into People", teaching unit. Penney's Educational Materials, 1971.
	2. Temperament situations vary within the family structure.	2. Prepare transparencies from cartoon depicting family life.	The Seventeen Guide to Knowing Yourself, Sugarman and Hochstein. The Macmillan Co., 1967.
	a. Some family situations involve doing things with specific instructions.	a. Have class prepare a list of jobs that students should be responsible for in the home.	
	b. Some situations within the family involve working alone while contributing to the final activity.	b. Use role playing to depict various family situations and the functions that can be employed in dealing with and/or understanding these situations.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
1. How does efficiency in clean-up and knowledge of safety procedures contribute to: a. the meal management b. the clothing construction process.	1. Comparing various clean-up procedures to determine the most efficient ways to prepare a meal.	Meal Management 1. Have students wash dishes by hand and use the dishwasher. Compare results in terms of time used, results obtained.	"Safety in the Kitchen" filmstrip, Cooking Series, McGraw-Hill Co. Safe Living, Harold Glenn, Chas. A. Bennett Co., Inc., 1960.
	2. Logic and perception are important for the safety of the individual.	2. Prepare a transparency on "Safety in the Kitchen" and use overlay "What is wrong here?"	Your Home and You, Greer and Gibbs. Allyn and Bacon, Inc., 1960.
	3. Safety, in part, depends on the ability to make a movement response accurately and quickly.	3. Use role-playing to show results of carelessness in the kitchen.	
	4. Different tasks involve different physical demands.	4. Invite school nurse to discuss home safety. a. Make an evaluation sheet on appearance of kitchen to be used after each kitchen activity.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		Clothing Construction	
		1. Have a discussion on reasons for using the correct tool in sewing - e.g. compare using a seam ripper and a razor to take out stitches.	Safe Living, Harold Glenn, Chas. A. Bennett Co., Inc., 1960. Your Home and You, Greer and Gibbs. Allyn and Bacon, Inc., 1960.
		2. Develop a work sheet for clean-up responsibilities in the classroom.	
		3. Invite a factory sewing operator to discuss the physical set-up of her work area and how her employer provides a safe place to work.	For other guest workers who might visit the class, see Appendices A and B for possibilities.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
1. Why should students attain an awareness of the child care and development processes? a. knowledge of ways in which children grow and develop b. importance of play in the early years of development c. traditional and current aspects of child care	1. Child-rearing practices differ throughout the world. (comparison)	1. Discuss child-rearing practices in other countries. Research information in the school library.	Learning About Children, Shuey, Woods and Young. J.B. Lippincott Co., 1964. "Learning Medium for Preschool Children," teaching unit. Penney's Educational Materials.
2. What are some of the activities that are demanded in child care? a. physical demands b. temperament c. interests	2. An analysis of child rearing outcomes is important to the choice of proper methods.	2. Invite a mother to class to tell of her experiences with child-rearing techniques.	"Child Care Series" filmstrips, McGraw Hill Co. Toys, Toddlers and Tantrums, Emily R. Dow. M. Harrows and Co., 1962.
	3. Students become aware of dealing with children in terms of their own individual abilities and those of the children. (Mentoring)	3. Take a field trip to a nursery school or invite a young child (or children) to class and observe and record his/their play behavior.	A Manual for Babysitters, Marion Lowndes Little, Brown and Co., 1961.
	4. Supervised play activities serve to promote harmonious relationships.	4. Have class plan to spend a specified length of time in a kindergarten class. Have them responsible for planning and carrying out organized play activities.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	5. Child care demands physical fitness of the students.	5. Discuss the physical requirements necessary for taking care of children.	
	6. The ability to work with children in various situations is important in child care.	6. Show a filmstrip that shows the interests and temperaments of children of different ages.	
	7. Preference for certain types of activities is related to the kinds of child care involvement performed by the student.	7. Have students interview neighbors in the community to discover what requirements they want a babysitter to fulfill.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
1. How can clothing construction projects help to develop self-esteem? a. wise selection of fabric and equipment b. development of skills in clothing construction c. knowledge of benefits of being abie to sew	1. The comparison of materials is important for proper choice and utilization of the finished product.	1. Take a field trip to a department store to observe a. clothing styles b. fabric c. sewing equipment	"Fashions and Fabrics" (booklet), Penney's Educational Material. "TLC for Textile" filmstrip. Penney's Educational Materials. "Textile for Today" (booklet), Celanese Fibers Co.
	2. Form perception is vital to a proper outcome of a clothing construction project.	2. Use overhead projector to show dress styles and fabrics suitable for various figure problems.	
	3. Clothing projects often involve frequent adjustment to environmental conditions,(e.g. noises of machines).	3. Visit a local factory where garments are made.	Mid-Hudson Area Occupational Monographs. Make Your Own, Kay Hardy. Hardy, Funk & Wagnalls Co., 1956.
	4. The ability to coordinate eyes, hands, fingers, feet efficiently into changing of a raw material (textile) into a finished product (dress) is necessary.	4. Demonstrate and have girls practice using a sewing machine.	Sew Easy, Peggy Hoffman. E. P. Dutton & Co., Inc., 1956. Smart Sewing,Catherine M. Doerr. The Mac-Millan Co., 1967.
	5. Various aptitudes are related to the outcome of the construction project. (cont'd)	5. Have girls select and complete a sewing project.	How You Look and Dress, Byrta Carson. McGraw Hill Co., 1959.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	a. The ability to visualize the pattern in a 3-dimensional way is important to the outcome.	5a. Lay out several patterns and have the members of the class describe how the finished garment would look. Discuss the spatial aptitude involved in such an activity and help class members to talk about their strength/weaknesses in this area.	Sewing Series, McGraw Hill Co. Step by Step Sewing Series. McCall's Patterns.
	b. Finger and manual dexterity is necessary for the proper completion of the project.	5b,c Show filmstrip which highlights various techniques and operations used in clothing construction project.	
	c. The ability to coordinate eyes, hands, feet, rapidly and accurately is necessary in clothing construction.		
	d. Color discrimination is important in the choice of a clothing construction project.	5d Invite the art teacher to discuss color and design in clothing.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
1. How is equipment used to develop skills in home economics?	1. An analysis of tool use is important to proper selection.	Meal Management 1. Take a field trip to a store selling major appliances.	Cooking Series filmstrip McGraw Holl Co.
a. What is the role of hand tools and appliances in the meal management process?		a. Have students work out a puzzle game - "What am I Used For?" Example - I flip pancakes - answer - spatuia.	"New Room in Your Kitchen" filmstrip. Rubbermaid Inc. Everyday Machines, Herman Schneider. McGraw Hill Book Co., Inc., 1950.
b. What is the role of hand tools and machinery in the clothing construction process?	2. For efficient utilization of equipment the students should be able to coordinate movements and use their hands easily and skillfully.	2. Have a series of demonstrations to show peeling potatoes, using a can opener, hand beater, etc.	Your Home and You, Greer and Gibbs. Allyn and Bacon, Inc., 1960.
	3. The ability to operate and control the equipment is important to project completion.	3. Demonstrate proper use and care of major appliances.	
	4. The proper use and care of equipment requires the ability to understand instructions, both written and verbal.	4. Divide class into groups. Have each group present a food demonstration on small portable appliances. Example - milk shakes in the blender. Emphasize verbal instructions. Repeat the experience having the groups work out written instructions.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		Clothing Construction 1. Assemble sewing equipment used in the classroom. Emphasize the right tool for the job. Relate these tools to the types of work functions involved. (See THINGS, D.O.T. Volume II, p.650). 2. Plan a bulletin board on the various parts of a sewing machine. Indicate the types of abilities and motor coordination (movements) necessary in its operation. Ask students to evaluate themselves on the following: finger dexterity, eye-hand coordination, form perception. See D.O.T., Volume II, p.653 for definitions of these abilities. 3. Demonstrate proper use and care of sewing machines. 4. Display sewing machine charts.	

VOCATIONAL MATURATION: A NEW APPROACH TO THE DEVELOPMENT OF LIFE SKILLS IN INDUSTRIAL ARTS

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Preface

Americans today are becoming increasingly aware of a return to fundamental values in our society; among them, being honest and sincere in our relationships with people, recognizing the inherent worth of the human being, and being concerned with the progress and protection of our society and environment.

The industrial arts field can be a distinct part of this return to creativity and concern with day-to-day living. Industrial arts should be considered for its contributions in this regard. Therefore, it will be referred to as a "life skills" field in the sense that it helps to make students aware of the on-going processes related to living, creative growth, and awareness of self.

Statement of Purpose

The ultimate goal of the vocational education area is to provide the youngster with skills for the world of work. The authors of this section have added to this goal by also stressing the world of living. The approach taken by the authors in the curriculum of industrial arts-home economics areas (life skills areas) will hopefully attain this outcome.

It is hoped that the life skills areas through the curriculum presented, will be elevated to the importance deserved within the educational continuum. It is a fact that often students will choose or are placed in this area because they cannot function or may doubt their ability to function successfully in a formal classroom setting. Conversely, those who overlook this field of study might do so because of the present societal pressures emphasizing the academic nature of higher education in the more traditional sense.

To assist the youngster in developing life skills to his fullest potential while concurrently attaining a level of vocational maturity has been the main concern in the preparation of these materials. Basically this growth can be fostered by introducing life skills experiences and attitudes in the elementary grades. Continual refinement and clarification should be a sequential and progressive part of the total educative experience.

It is hoped that in the following presentation, one will preceive the life skills areas in a different light. If this is accomplished, then it is possible that more students will avail themselves of study in these areas. It is hoped that this new approach to the development of life skills will provide some direction and guidance for the student who may not know where he is headed. Above all, we believe these ideas, if implemented in the home economics - industrial arts classroom, will contribute to a very important task of education for the early adolescent - that of helping him to achieve a measure of self identity.

The authors recommend that educators, parents, community and industrial leaders become knowledgeable and involved in the curriculum of the life skills. We believe that the material suggested can be a useful guide for the early secondary school teacher of the life skills. Lastly, the suggestions in this new approach are not a panacea; they are only a beginning.

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Why are the industrial arts and home economics subject areas referred to as "life skills"? DEFINITION: Life skills are the learnings necessary for the individual to interact with his environment (both in a positive and negative sense).	1. The life skills take into account all of the human senses.	1. Bring to class several types of fabrics and be prepared to discuss why or why not you would use each for varying purposes.	Filmstrips: "What is Your Future in the Changing World of Work?" Eyegate, 1971. "Preparing for the World of Work". Guidance Associates, 1970. "An Overview of Technical Education" Guidance Associates, 1970. "Mid-Hudson Area Occupational Monograph (See Appendices A and B) Mid-Hudson Career Development and Information Center, Beacon, New York
	2. Life skills are concerned with intelligent consumer choices.	2. Set up a display of several of the same product, each made from different materials; (e.g. handbags - made from leather, plastic, synthetics, string). Ask students why they would choose one handbag over another.	
	3. Life skills provide unique experiences in the development of safety habits.	3. Construct a bulletin board showing safe and unsafe life skills procedures.	
	4. Development of life skills is a sequential process.	4. Construct a flow chart showing steps involved in the simple tune-up of an automobile. Discuss sequential steps involved.	
	5. Life skills contribute to employability.	5. Show pictures to class showing men and women engaging in various occupations. Ask students to explain what they see.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		6. Set up a display table of various materials (e.g. tools, plastics, paints, etc.). Ask students how these materials are related to the world of work.	
		7. Mimeograph and distribute some job descriptions from Mid-Hudson Occupational Monograph. Discuss how students can prepare themselves for these jobs today.	See Appendices A and B

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
What is work? DEFINITION: Physical and/or mental expenditure of energy in the production of a good or service. Work involves the application of learned skills.	1. There are many types of work: 0-1-Professional, technical and managerial occupations 2-Clerical and sales occupations 3-Service occupations 4-Farming, fishery, prestige occupations 5-Processing occupations 6-Machine trades occupations 7-Bench work occupations 8-Structural work occupations 9-Miscellaneous occupations	1. Organize role-playing with students to portray one occupation within each of the 0-9 groupings.	Job Family Booklets SRA "Vocational Guidance Models: A Review" - N.Y.S. Education Department, Bureau of Guidance. You Can Work in the Education Services by Betty Dietz, John Day Co., 1968. "Work Efficiency - How to Control Fatigue" - Compton's Encyclopedia Vol. 24. Help Wanted: Female The Young Woman's Guide to Job Hunting. King, Alice G. - Scribner, 1968. In selecting occupations, or in having students select occupations, teachers may wish to refer to those found in the Mid-Hudson area. See Appendices A and B.
	2. Various types of work demand various levels of preparation. 2a Work and job requirements are constantly in a state of flux.	2. Choose 3 varying occupations (e.g., nurse, clerical worker and welder). Show what specific vocational preparation is required for each (see DOT, Appendix A, pg. 652)	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	3. Work results in societal stratification.	3. Have each class member represent a different occupation. Each student would then discuss with what occupational group he would like to be associated with and reasons why (economic sociogram).	
	4. Each type of work contains its own inherent worth.	4. Ask the school secretary to discuss her role in terms of contributing to the efficient school operation.	
		5. Get an idea of different types of work by visiting local industries - factory, service, managerial, technical. Classroom discussion to follow regarding types of work seen.	Also see Appendices A and B

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Why do people work? People work to satisfy individual needs and wants.	1. People work to satisfy economic needs. a. basic needs b. wants beyond needs c. long-term individual and family planning.	1. Ask class to imagine that family breadwinnner(s) suddenly becomes unemployed. What effect would this have upon your family as a whole? Upon yourself as an individual?	Record: "A Man's Work" (50 records). McGraw-Hill, 1971. Filmstrip: "Why Do People Work?" Visual Ed. Consul. Inc., Madison, Wis.
	2. People work to satisfy society's needs. a. improvement of society b. day-to-day operation of the economy c. providing of goods and services	2. Choose one occupational cluster (e.g. health services) and make a blackboard list of all occupations within that cluster. Have students do research into one of the specific occupations and then explain to class its relevance to the entire cluster. (See Appendix B)	Occupational Video Tapes, Mid-Hudson Career Development & Information Center, Beacon, N.Y. Film: "How We Make a Living". U. S. Bureau of the Census. Occupational Information in the Elementary School, W. Norris. SRA Association, 1969. Occupational Information Robert Hoppock. McGraw-Hill, 1967.
	3. People work to satisfy psychological needs (enhancement of self-concept). a. spirit of adventure b. prestige-self-esteem	3. Ask parent involved in hazardous occupation (e.g., steeplejack, stock car driver) to speak to class as to reason why he chose this field.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	4. Needs influence occupational choices.	4. Ask student who works after school or during summer to speak to class as to his reasons for working with attempt to show that there are reasons other than economic for working.	
		5. Have class imagine a society in which no one worked. Discuss implications-socially, economically, personally.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
What are current attitudes toward work? a. by students b. by students' parents c. by employers d. by labor unions e. by various levels of government f. by schools	1. Some of today's students feel traditional occupations are meaningless.	1. Present traditional and current (commune, "return to the earth") work concepts. Discussion of relative worth of each by class.	The Greening of American, Charles A. Reich, H. Wolff, 1970. Future Shock by Alvin Toffler, Bantam, 1971. "Credentials and Common Sense: Jobs for People Without Diplomas". Manpower Report U.S. Dept. of Labor, Dec. 1968. Filmstrip: "Getting and Keeping Your First Job". Guidance Associates, 1971. Speakers Bureau: Mid-Hudson Career Development Center, Beacon, N.Y. Publications from N.Y.S. Bureau of Appretice Training.
	2. Familial influence in assisting students to choose an occupation is lessening.		
	3. Technological changes have brought about a minimizing of physical abilities and maximizing of mental processes and creative abilities. a. There is stress today in the world of work upon various aptitudes related to technological change: intelligence, verbal, spatial understandings. b. There is less stress upon physical demands such as lifting, pulling, carrying activities.	3. Visit the school Data Processing Center to demonstrate concept #3.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	4. There has been a resurgence of craftsmanship in the American society within the last five years.		
	5. Employers are looking for increased productivity in return for higher wages and more employee benefits.	5. Lecture by local management and labor union leader as to role of business and labor in life skills area. (new trends in both management and labor; e.g., concept of accountability cost-reduction procedures, increasing production, 4-day, 40-hour work week.)	
	6. There is an increasing concern for ecological implications on the part of employer and employee.		
	7. Unions are becoming increasingly concerned about job security for their members.		
	8. There is much mobility within various occupational fields.	8. Secure resource speakers who have been mobile within their occupational fields.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	9. Economic factors are responsible for cutbacks in government jobs today. Job security in government jobs is becoming less prevelant.		
	10. Schools are becoming increasingly concerned about the dissemination of occupational information.	10. Ask school guidance counselor to speak with life skills classes regarding sources of occupational information in guidance office.	See Appendices A and B

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CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
How can an early secondary student prepare himself today (in a general sense) for the world of work. Through the life skills?	1. A student should be aware of the "self" in relation to the environment.	1. Have students fill out or make up a job application. (Use N.Y.S.E.S. Application forms)	N.Y.S. Employment Service. Employment Data Applications "Women in the World of Work". N.Y.S. State Education Dept. Division of Research, 1969. Career Choices for the 70's, A. Arnold. Crowell-Collier Press, N.Y., 1971. Filmstrips: "Preparing for the World of Work". Guidance Associates, 1971. "Preparing for Jobs of the 70's". Guidance Associates, 1971. "If You're Not Going to College". Guidance Associates, 1971.
	2. Students should be aware that education is an on-going, life process.	2. Have college-bound high school students visit class to become aware of career opportunities available in the life skills.	
	3. An awareness of life skills is essential for occupational success.	3. Conduct a field trip to a local BOCES center.	
	4. A role in student government sometimes provides a background for sound occupation choice. (e.g. acceptance of authority; sharing of responsibilities).	4. Observe a Student Government Association in action. Discussion of concepts observed (e.g. leadership roles; delegation of duties).	
	5. Maintenance of sound physical and mental health is essential for participation in the world of work.	5. Have the school nurse talk with life skills classes on health and safety considerations.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
What are the educational opportunities available after junior high school in the life skills? a. high school b. college (4 years, 2 years, and certificate programs) c. continuing education d. on the job training e. apprenticeship f. drop-out programs (JOBS, NEGRO, Harlem Prep, Job Corps) g. In-plant training	1. There are high school courses available in the further development of life skills.	1. Visit BOCES Center to help in possible occupational choices through selection of school vocational sequences.	Zapolean, M. W. Occupational Planning for Women. Harper & Bros, New York, 1961. Contact NYSES job counselor for Job Corps information.
	2. There are available degree (2 years) and non-degree (1 year or less) programs in S.U.N.Y. colleges for pursuing post-high school education in life skill areas.	2. Ask an admissions representative from a State University of New York community or agricultural and technical college to speak to life skills classes explaining these programs.	Kaplan Max. Leisure in America: A Social Inquiry N.Y. Wiley, 1960. "Work Together for Youth" - N.Y.S. Dept. of Labor, Division of Employment. Filmstrips: "No Limit to Learning" College Entrance Examination Board, 1964
	3. N.Y.S. Dept. of Labor and labor unions sponsor and administer varying apprenticeship programs.	3. Ask member of Apprenticeship Bureau to speak to large group of 7, 8, 9th graders.	" Career Programs in Two-Year Colleges" N.Y.S. Education Dept., Bureau of Occupational Education Research, 1970.
	4. Job Corps opportunities are available for high school and junior high drop-outs.	4. Ask Job Corps counselor from NYSES to speak with potential dropouts as identified by counselor in life skills classes.	
	5. Interest activities can lead to occupational choices.	5. Show pictures of people involved in various leisure time activities. Discuss ways in which these activities can help	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		in making an occupational choice.	
		6. Take D.O.T. worker traits (training time, aptitudes, interests, temperaments, physical demands, and working conditions) and have student relate them to various levels of preparation for different occupations using qualifications profile.	Duplications of various job descriptions from D.O.T. (See School guidance counselor). Use occupations suggested in Appendices A & B

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
How are occupations structured within the life skills area? 1-D.O.T. Occupational Group Arrangement: 0-1-Professional, technical, managerial occupations 2-Clerical and sales occupations 3-Service occupations 4-Farming, fishery, forestry 5-Processing 6-Machine trades 7-Bench work 8-Structural 9-Miscellaneous Jobs are groups according to a combination of work fields, purpose, material, product, subject matter, service, generic term and/or industry.	1. There are many levels of entry occupations within the life skills.	1. Ask representative from Central Hudson Gas and Electric Corporation to speak to life skills classes regarding entry occupations in his company.	Local community colleges D.O.T. Apprenticeship Bureau Member Labor Union Leader Jobs to Take You Places Here and Abroad, Adrian A. Paradis McKay Co., 1968. "Evaluation of Secondary School Programs to prepare students for wage earning in occupations related to Home Economics" - N.Y.S. Education Dept., Bureau of Occupational Educational Research, 1968. In selecting occupational groupings, see Appendices A and B.
	2. Occupations are grouped into nine main categories (see content).	2. Mimeo 9 occupational groupings individually on separate sheets of paper. Pass around at random and have students identify jobs within individual grouping.	
	3. The life skills are involved in all of the nine occupational categories.	3. List the nine occupational groupings on a blackboard. Ask students to choose an occupation within the life skills area and relate it to as many groupings as they can.	
	4. The occupational groupings differ with regard to skills, education and training.	4. Have students choose an occupation within the life skills and construct a flow chart showing preparation for	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
		entry in regard to: a. skills b. education c. training	
	5. The changing nature of occupations leads to a need for greater individual flexibility.	5. Have students role play to depict reasons why a physicist is unemployed today.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
How is self-evaluation important to the development of life skills?	1. Knowledge of individual skills can indicate to students a potential work field.	1. Prepare self-evaluation sheets and/or progress charts in life skills classes so that students can evaluate themselves. 1. Prepare a series of thought provoking interest statements to which students respond positively or negatively.	Strong Interest Inventory SRA Interest Inventory Kuder Interest Inventory Filmstrip: "Foundations for Occupational Planning" Singer/SVE, Chicago, Ill., 1971. The Seventeen Guide to Knowing Yourself, D. A. Sugarman & R. Hockstein Macmillan, 1967. Filmstrips: "Who Are You?" "What Do You Like To Do?" Singer/SVE, 1971.
	2. Self-analysis regarding the following will assist in decision-making about occupational choices within the world of work: a. temperament b. aptitudes c. interests d. training time e. physical demands f. working conditions	2. Distribute D.O.T. job descriptions of dietician and tool-and-die maker. Ask students if they feel they would be happy in these positions giving reasons why or why not. 2. At conclusion of work session or project in life skills class, ask students how they felt working within teacher-classroom guidelines. Compare these feelings with an actual job experience.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	3. The school experience contains many elements that are common to the work experience.	3. Assign students to various responsibilities necessary for the efficient operation of the life skills class. Relate class responsibilities to similar ones that would be present on the job. Invite students from high school life skills classes to speak about reasons for their choice and future goals. Encourage life skills students to attend Career Night and College Night activities. Have students interview local businessmen as to their reasons for entering their particular occupational field. Report to class and have students express preferences or dislikes for possibly entering the occupational area concerned.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
Why are interpersonal relationships significant in the classroom setting? ...and in the world of work?	1. The life skills lend themselves to a spirit of cooperativeness and creativity in the classroom.	1. Use the foremanship system for cooperativeness in environmental maintenance (ie: clean-up activities).	Filmstrips: "Dropping Out - A Road to Nowhere" Parts I & II, Guidance Association. "Your Personality: The You Others Know" Guidance Association, Pleasantville, New York.
	2. Skills taught in the life skills area often carry over to the world of work.	2. Conduct a field trip to local industries (Star Expansion, GAF, Interstate Bag) to observe learned life skills in operation. A trip to a local dress factory.	Film: "It's Your Move: Decisions for Discussion" Coronet Films, 1970. Filmstrip: "Life Issues" Series by Singer/SVE, 1971.
		2. Have owner of local automotive business visit industrial arts classes to discuss job functions and skills of his mechanics; school dietician to home economics class.	
	3. Interpersonal relationships developed in the life skills carry over to the world of work. a. pupil-pupil worker-worker b. pupil-teacher employee-employer	3. Have students role play using employee-employer concept. Have the players and the class discuss their feelings and any concepts gleaned from skit.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
	c. pupil-student government worker-union		
	d. student government-school union-management		
	4. Life skills occupations involve adjustment to varying temperaments: e.g. situations involved with:	4. Visit to automotive or cosmetic plant to observe assembly-line procedures. Stress awareness of dependence of workers upon each other and upon their individual efforts.	
	a. direction, control, and planning of an entire activity		
	b. dealing with people in job duties beyond giving and receiving instruction	4. Have guidance counselor visit life skills classes to discuss importance of cooperation.	
	c. influencing people in opinions, attitudes or judgments about ideas or things.		

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
What is the function of education for recreation in the life skills? e.g. a. needle-craft b. woodworking c. home-maintenance	1. Recreation is a significant part of the American life style today.	1. Make a list of life-skill activities pursued during after-school and after-work hours; during vacation periods.	How to Make Something From Nothing Ruth A. Egge. G. P. Putnam's Sons, 1968. Filmstrip: "Leisure" (show and describe the purpose and value of leisure time). Singer/SVE, 1971. Complete Book of Needlework and Embroidery, W. Butler. G. P. Putnam's Sons, 1967. Meaning in Crafts by E.L. Mattil, Prentice-Hall, 1965.
	2. Acquired knowledge of the use of tools is beneficial in the pursuit of hobbies or avocations for leisure or nonemployed time.	2. Make a collage using materials leftover from a project (see art teacher for ideas.) 2. Students bring to class and discuss and/or demonstrate various hobbies.	
	3. Vocational endeavors may be an outgrowth of avocational pursuits.	3. Invite a recreational activity college major to class to discuss recreation as an occupational field.	
	4. Leisure time pursuits may be more gratifying than work.	4. Show filmstrip "Leisure". Discuss purpose and value of leisure time today.	
	5. The world of work is moving toward a 4-day, 40-hour work week.	5. Discuss implications of 4-day, 40-hour work week; i.e. how man will use increasing amount of nonemployed time in coming years.	

B. LIFE SKILLS IN THE INDUSTRIAL ARTS CLASSROOM

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
1. What is the importance of synthesizing, analyzing, computing, compiling and coordination in making any industrial arts project?	1. A successful work experience requires proper planning.	1. Provide students with blueprints; discuss steps taken leading to actual implementation of process.	General Industry, J. Lindbeck and I. Lathrop. Chas. A. Bennett Co.
	a. analyzing a plan to determine material suitability.		Woodworking, W. Wagner. Goodheart Wilcox, 1968.
	b. performing arithmetic operations to compute cost.	a. show the relationship of color, texture and mass to the finished project.	Metalworking, Boyd. Goodheart Wilcoz, 1968.
	c. coordinating sequence of operations.	b. Make necessary computations in relation to a planned project: 1. cube 2. square 3. solid-weight 4. linear 5. volume	"Transparencies: Micrometers and Vernier Gages" Paxton Patterson Co., 71/72. "Quality Control" University of Illinois Visual Aids Service, Champaign, Illinois, (10 min film) 61822.
		c. Use a check-off sheet as operations are performed.	
2. Why are aptitudes such as numerical, finger and manual dexterity, important in developing life skills?	2. The use of measuring tools requires manual dexterity.	2. Demonstrate the use of the micrometer.	
3. Why are work functions like precision working and manipulating necessary?	3. Measurement is related to spatial aptitude: a. geometric dimensions. b. linear dimensions.	3. Make a pattern for a bowl and discuss the use of a template.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
4. How does the individual adjust to greater skill requirements?	4. Mass production requires the interchange of parts.	4. Swap parts of two jack planes. Discuss availability of replacement auto parts.	
	5. Eye-hand coordination skills result in the effective use of gages.	5. Show how a go, no-go gage is used.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
HAND TOOLS			
1. How are hand tools used in the processing, assembly and finishing of materials?	1. There are multiple considerations involved in tool selection.	1. Demonstrate grain of wood, texture and hardness of various substances.	8MM Films "Woodworking Series" McGraw Hill Brief Films. 42 films 3-4 mins.
	1. Analysis of material determines tool usage.	2. Display tools used for wood, plastic, metal, clay, leather and graphic arts.	"I. A. Benchwoodwork," J. Feirer. Chas. A. Bennett Co., 1959. Woodworking, W. Wagner. Goodheart Wilcox, 1968.
	3. Perception is essential in determining the best measuring tool.	3. Illustrate ways thickness, width, length, diameter, and weight are determined.	Metalworking, T. Boyd. Goodheart Wilcox, 1968.
	4. The selection of materials is determined by individual preference.	4. Show relationship of color, texture and mass to shape or form.	Tool Catalogs; 1. Snap on tools 2. Stanley 3. Lufkin
2. What are some temperaments presented by the processing, assembling and finishing of materials?	5. Precision working to close tolerances involves hand tools.	5. Use the micrometer and vernier caliper to measure a piece of paper and a human hair.	General Plastics, R. Cherry. McKnight & McKnight, 1967. "Experimental Resource Unit in Plastics for Industrial Arts" State Education Dept. Albany, 1966.
		6. Have students using nails, screws, bolts, rivets, solder and welding as fastening techniques.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
MACHINE TOOLS 1. What is the value of learning machine operation?	1. Specific machines do multiple jobs. 2. Proper machine choice is essential to make a finished project.	1-2 Have students analyze their project needs in relation to the selection of the machine for carrying out the project. In preparation for the project have each student discuss his analysis with the teacher.	Woodworking With Machines, J. Douglass. McKnight and McKnight, 1960. Cabinetmaking and Millwork, J. Feirer. Chas. A. Bennett, 1967. General Industrial Machine Shop, H. Johnson. Chas. A. Bennett, 1967.
2. What work functions are important in machine operation? a. setting up b. precision working c. operating-controlling d. manipulating	3. Correct machine set-up is essential for safety and correct results.	3. Demonstrate correct worker stance when operating a machine.	Industrial Arts, Electricity, Lush and Engel. Chas. A. Bennett, 1965. Apprenticeship in America, H. Kursh. Norton, 1965.
	4. The project must conform to the dimensions given on the plan sheet.	4. Show how machine guides are used in cutting and fabricating.	Filmstrip "Manufacturing" 636-5 Singer SVE 1968.
	5. Machines must be operated within specific speed ranges.	5. Discuss safe operating speeds of various machines in relation to material used.	
	6. The operator must be aware of machine controls and capabilities.	6. Talk about the ways a student may acquire knowledge of machines. a. charts b. manuals c. brochures	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
3. Why are numerical skills important to mass production techniques?	7. Production advancement depends on numerical controls and automated techniques that are an integral part of today's mass production techniques.	7. Discuss automated techniques in modern industry. Visit a modern industrial plant, illustrating automation.	
	8. Careful estimation of material requirements is essential in avoiding waste.	8. Show how printing stock is cut to avoid waste. Make out a bill of material and compute final cost.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
SAFETY 1. How is safety in the shop related to the total environment?	1. Safety procedures are mandated for safe shop operation. a. eye protection b. machine controls c. clothing protection d. fire protection e. cleanliness f. material handling (physical demands-lifting, carrying, pulling and pushing)	1. Make and display posters illustrating safe procedures. 1. Show films and filmstrips on safety in the shop. 1. Discuss reasons for cooperation as necessary for safe shop procedures.	Coronet Filmstrips 1. Safety in the Shop: Basic Practices. 2. Safety in the Shop: Hand tools 3. Safety in the Shop: Power tools.
2. How do employers cooperate with management in preventing injuries?	2. Cooperation is needed for safe management.	2. Invite a plant safety engineer to discuss working conditions in relation to safety conditions.	Talk by industrial safety supervisor from local plant. See Appendices A and B work role suggestions based on occupations in the Mid Hudson region.
	3. There are physical limitations of student activity areas.	3. Mark specific areas as hazardous.	
	4. The boundaries of the classroom are extended into the world of work.	4. Discuss safety procedures used in industry regarding practices to be carried over to the total environment.	

CONTENT	CONCEPTS	TECHNIQUES	RESOURCES
CONSUMER EDUCATION What are the specific consumer values acquired in making a lamp? (The above is given as an example for developing the concepts presented and to portray industry's role in education. e. g. Central Hudson Composition Contest)	1. Student familiarizes self with function of design. (comparing)	1. Have students design a pattern for a lamp. This illustrates spatial, form perception, and takes into account material utilization. Be sure to allow time for student self-evaluation on each of these abilities/aptitudes.	"Forum" J. C. Penney Co., 1971. "The Story of Building a House" Nine filmstrips - Eye Gate, 1971. "Car Care for Safety" 7 filmstrips, Eye Gate, 1971.
	2. Aesthetic values are important in good design. analysis.	2. Have students make à requisition for materials to be used. This involves computing, compiling, and comparing.	
	3. Bill of material is considered in the planning stage regarding cost, utility and safety. (analyzing, numerical)	3. Display various materials and discuss their use in and outside of the home environment.	
	4. Knowledge of materials is important to good consumer education. (analyzing, comparing)	4. Compare various materials regarding weight, texture, appearance, and utility.	

RELATIONSHIPS BETWEEN
VOCATIONAL DEVELOPMENT
AND THE PHYSICAL EDUCATION
CURRICULUM IN GRADES 7, 8, AND 9

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INTRODUCTION

Physical education is a "child centered" activity. The curriculum in physical education is designed to help meet the maturational needs of young people -- physically, emotionally, mentally, and socially. Several authoritative books have outlined the needs and characteristics of the individual during the years of childhood and youth. A good number of these have provided activities, methods and techniques to help develop and implement meaningful curriculum in physical education consistent with these needs and characteristics.

It was not our purpose in this guide to reiterate these needs, techniques and activities from a physiological, sociological and psychological point of view. Rather, we attempted to correlate the existing curriculum with its inherent significance for various work trait components, training time, interests, temperaments, aptitudes, physical demands and working conditions.

Many of the suggestions and materials presented in this guide are applicable at various secondary grade levels. However, we have tried to emphasize activities which are particularly significant in the middle or the junior high school years.

I. TRAINING TIME

Training time in the world of work refers to general education development and specific vocational development necessary for average performance in a particular job. General education refers basically to formalized instruction as in high school or college, and is non-specific in nature. Specific vocational preparation is related to training for a specific job area. (D.O.T., Volume II, Appendix B, p. 651)

Physical education, being part of the total school environment has a built-in program of general education activities planned at particular levels according to the developmental needs of youth.

Specific vocational development can be related to physical education in that skill areas are usually taught in progressions from year to year, and within each unit in a particular year. Also, at different grade levels, different skills and levels of skills are presented.

In order to present rational parallels between training time in vocational preparation and "training time" in physical education, the following comparisons can be made. (These circumstances of vocational training follow the D.O.T., Volume II, Appendix B, p. 652.)

a. Vocational education (such as high school commercial or shop training, technical school, art school, and that part of college training which is organized around a specific vocational objective.)

In physical education this can be related to the time spent by the instructor or coach in verbal instruction in a particular skill, use of slides, filmstrips and loop films as teaching aids and (in athletics) analysis of game films, in preparation for skills performance. Very often the use of films, etc., as preview to a particular unit gives the students an awareness of the skill involved (which they may never have seen before) which will be of invaluable aid to them in learning to perform the skill. This may be especially true in activities such as gymnastics, wrestling and soccer.

Verbalized background information given by the instructor also falls into this category, as does the lecture-demonstration method of instruction.

b. Apprentice training (for apprenticeable jobs only.)

In the world of work there is a hierarchy of apprentice-journeyman-master. In physical education perhaps the best parallel that can be made would be in the area of athletics. A member of a junior high school team, at the first level of exposure might be considered an apprentice. A member of a high school junior varsity team could similarly be considered a journeyman, and the attainment of varsity status could be equivalent to becoming a master craftsman.

c. On-the-job-training (serving as a learner or trainee under the instruction of a qualified worker.)

This is inherent in physical education. As the students are learning and developing skills, they are "working under" the guidance and instruction of the teacher. This could apply to the learning of simple games or calisthenics as a result of brief demonstration or instruction, or to the improvement of simple tumbling skills through practice and with the help of the teacher in analyzing mistakes and making suggestions to correct them.

d. In-plant-training (given by the employer in the form of organized classroom study.)

In physical education after particular skills are learned, the instructor may verbalize instruction to show proper application of these skills in a more refined situation. Strategy may also be discussed as well as a progression from basic skills to more sophisticated and/or different skills.

e. Essential experiences in other jobs (serving in less responsible jobs which lead to the higher grade job or serving in other jobs which qualify.)

The learning of physical skills in progression offers a parallel to this situation. As one skill is learned and developed the student is able to move on to skills of a higher degree of difficulty.

In the area of athletics, this situation is applicable in that an athlete may perform his own particular task or job, i.e. "play his position" and at the same time be learning the skills and needs of another particular job or task-"position".

The D.O.T. contains an explanation of various levels of specific vocational preparation in relation to length of time of training. The time ranges from Level #1 (short demonstration only) to Level #9 (over ten years). Although this range may not be present within a specific unit in physical education there is a time range involved in the level of ability in a particular skill. The use of a progression of skills, within an activity from year to year implies a time factor. Length of time of involvement in a particular skill (experience) very often results in a higher degree of ability in that particular skill.

II. INTERESTS

The D.O.T. defines interests as "preferences for certain types of work activities or experiences with accompanying rejection of contrary types of activities or experiences". Although this definition applies to interests in the world of work, it can be just as readily applied to interests in the areas of physical education and athletics. In a comprehensive, viable physical education program every child has the opportunity to experience numerous and varied activities which are either attuned to his particular interests or afford him the opportunity to develop new interests. Often these interests nurtured and developed in the physical education program play an important role in the development of interests in the world of work.

The purpose of the following chart is to illustrate parallels between interests in specific occupations and activities in the physical education program.

INTERESTS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Activities concerned with people and the communication of ideas.	1. Teachers 2. Lawyers 3. Supervisors, all kinds 4. Foreman	1. Team sports, in general 2. Individual sports, in general 3. Physical education programs, in general	1. In team sports, players communicate with one another (instructions on plays, encouragement, etc.). 2. In individual sports, participants communicate with their coaches abou their performances. They also communicate with other participants 3. As in organized athletics, students discuss with their teachers and peers activities during physical education class.

INTERESTS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Situations involving a preference for working for people for their presumed good, as in the social welfare sense, or for dealing with people and language in social situations.	1. Social service caseworker 2. Teacher 3. Guidance counselor	1. "Buddy System" in physical education class. 2. Teacher aides in physical education.	1. The "Buddy System" in physical education classes fosters the idea that helping teach other students less skilled than themsel is worthwhile. 2. Similar to the "Buddy System" which requires students to be paired together in a helping situation, teacher aides can be used to help other members of the class who might be experiencing difficulties learning the material. The obvious difference between the "Buddy System" and teacher aides is that teacher aides usually assist more than one student.

INTERESTS From Dictionary of Occupational Titles (Vol. II, App B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Activities resulting in tangible, productive satisfaction.	**1. Tool & Die maker** **2. Carpenter** **3. Plumber**	**1. Team sports, in general** **2. Individual sports, in general**	Whereas the tool and die maker, carpenter and plumber are interested in producing a worthwhile product such as a perfect machine part, a solidly framed house or a tight pipe joint, the productive satisfaction obtained from team and individual sports might come with winning a game, making a good play or perhaps just playing the game. In the physical education program, just as in organized athletics, satisfaction may come from perhaps learning new skills, playing a good game or participating with classmates in a social, non-threatening atmosphere.

INTERESTS From Dictionary of Occupational Titles (Vol. II, App B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Activities of a scientific and technical nature.	1. Automobile mechanic 2. Plumber 3. Electrician 4. Medical profession	1. Team sports, in general 2. Individual sports, in general	Numerous occupations require the worker to have knowledge of a scientific, and/or technical nature. For example, the automobile mechanic must be thoroughly familiar with the theories in physics, electricity, combustables, etc. as they apply to the functioning of an internal combustion engine. Just as the mechanic knows about an engine, the diver or gymnast knows or should know how the body moves. He must have a working knowledge of physiology and kinesiology in order to understand how to execute movements efficiently. Examples in team sports where the participants are involved in technical matters are the understanding and developing of specific plays and game strategies such as in football, soccer, hockey, etc.

INTERESTS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Activities of an abstract and creative nature	1. Professional athletics 2. Professional dancers 3. Research scientists	1. Team sports 2. Gymnastics 3. Diving 4. Modern dance unit in physical education program	In physical education and athletics students must work with and understa abstract ideas. For example, in a physical education unit on basketbal or in varsity athletics, the teacher or coach presents diagrams to the student or explains new formations o plays. The student, in order to ful understand the new material, must memorize not only what action he must take but every action of each member of his group.

INTERESTS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Activities that are non-social in nature and are carried on in relation to processes, machines, and techniques.	**1. Fork lift operator** **2. Lathe operator** **3. Assembly line worker**	**1. Field events** **2. Gymnastics** **3. Diving**	Just as the fork lift operator, lathe operator and assemblyline worker uses a machine and/or implement and usually functions in a nonsocial environment, so do certain athletes. The shot putter works alone and uses an implement, the shot. The diver and gymnast is interested in functioning by themselves. They, too, must use machines and/or implements - the diving board, the high bar, rings, parallel bars, etc. In reference to processes and techniques every athlete (including those mentioned above) have set procedures and techniques which they apply to accomplish their tasks.

INTERESTS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Activities of a routine, concrete, organized nature	1. Assembly line worker 2. File clerk 3. Shipping clerk	1. Track events 2. Calisthenics 3. Swimming 4. Cross Country 5. Etc.	1. The running events in track are highly organized and routine. A runner must go a certain distance, in a certain lane, or around the same particular track. 2. Calisthenics are extremely routine and repetitious. 3. Swimming events are also highly organized and repetitious in that each swimmer must use a specific stroke, swim a specific distance and remain in a specific lane.

INTERESTS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Activities resulting in prestige or the esteem of others.	1. Corporation executives 2. Professional athletes 3. School principals	1. Tumbling and gymnastics 2. Track and field 3. Wrestling 4. Etc.	1. In physical education, prestige and esteem is often gained by being "best" - the fastest runner, the strongest or best wrestler (tournament winner, etc.), the successful gymnast all gain prestige and esteem. 2. To be a member of a successful team, or sometimes, to be able to "make the team" often results in prestige and esteem. 3. Some positions (quarterback, pitcher, etc.) are more prestigious than other positions (lineman).

INTERESTS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Activities dealing with things and objects.	1. Plumber 2. Carpenter 3. Automobile mechanic	1. Field events 2. Softball 3. Etc.	1. Field events in track and field, especially the throwing and weight events, require the use of things and objects, e.g. shot put, discuss throw, pole vault, etc. 2. The implements of softball are bats, balls, gloves, bases, catchers equipment, etc.

III. TEMPERAMENTS

In the world of work there are different types of occupational situations to which workers must adjust. For example, some work situations involve a variety of duties often characterized by frequent change. Other situations require workers to involve themselves with repetitive or short cycle operations carried out according to set procedures or sequences. How well workers succeed in these dissimilar situations depend to a great extent on the unique temperament of the individual.

In physical education and athletics there are situations which closely parallel situations found in the working world. In these situations, participant, like the worker, must adjust. As in the world of work, the degree of success in any given athletic and/or physical education task hinges a great deal on whether the participant's temperament is attuned to the demands of the task. For instance, the number and variety of frequently changing demands make upon a quarterback can be accomplished most successfully by a person whose temperament is receptive to such vigorous, frenetic demands. Though most boys would like to see themselves as quarterbacks, very few have the unique temperament required for the job. Fortunately, the position of quarterback is but one of many on a team thereby allowing boys whose temperaments differ to adjust and succeed at various other positions.

With the idea that temperaments effect the way individuals function in the milieu of play situations as well as those of work, the physical education teacher has the opportunity to provide every student with experience in many varied situations. Second, he must afford the student the chance to self-evaluate his thoughts and feelings about the situations in which he participated. Last, and most important, where possible, the teacher must allow the student to choose the situation which suits his individual temperament. Not only will this process of varied experience, self-evaluation, and freedom of choice enhance the viability of the total physical education program but it will also aid immeasureably to the vocational maturation process of every student.

The following charts are intended to illustrate some of the parallels between situations in the world of work, and situations in physical education activities. The examples and illustrations on these charts are not meant to be complete and comprehensive, but merely to point out some of these parallels.

Each situation requires that an individual be of a certain temperamental disposition, and that his temperament will predicate his ability to function effectively at a particular task or in a particular situation. Also it must be remembered that a single occupation or a single physical education activity may provide many of the different situations described. No one situation, occupation or activity should be considered as exclusive from another.

TEMPERAMENTS

SITUATIONS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Involving a variety of duties often characterized by frequent change.	1. Labor Foreman 2. Office Manager 3. Newspaper Editor	1. Team Sports A. Football B. Soccer C. Baseball	1. A quarterback on a football team, a baseball pitcher, a soccer or la-crosse goalie must adjust to game situations which change frequently and make decisions which affect the success or failure of the task at hand, i.e. "the game".
		2. Individual Sports A. Badminton B. Skiing C. Tennis D. Golf	2. The "lie" of a golf ball, the features of a ski run, the flight of a tennis ball provide situations which require adjustment and decision-making to successful follow-up.

TEMPERAMENTS

SITUATIONS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Involving a repetitive or short cycle operation carried out according to set procedures or sequences.	1. Production Line worker 2. Automobile Lubrication Man 3. Inspector (garment)	1. Team Sports A. Football B. Basketball	1A. An interior lineman has a specific task for which he is specifically trained to carry out according to specific procedures. He is not in a decision-making position, however his job is vitually necessary. 1B. Foul shooting is a short cycle operation carried out according to set procedures.
		2. Individual Sports A. Track & Field B. Gymnastics	2A. Sprinting, shot put, etc. 2B. Mandatory routines or stunts in gymnastics

TEMPERAMENTS

SITUATIONS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Involving doing things only under specific instruction allowing little or no room for independent action in working out job problems.	1. Messenger 2. Utility Maintenance Man 3. Trademan's Helper	1A. Football B. Dance C. Swimming D. Gymnastics E. Track & Field F. Calisthenics	1A. A football lineman's job is determined by the decision of the coach or quarterback in their decision-making role of play calling. B. Square, folk and social dance forms are generally non-innovative, that is, they are performed according to specific instruction. C. There is only one direction to go on a track - for a set distance and often in a set lane.

TEMPERAMENTS

SITUATIONS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Situations involving the direction, control and planning of an entire activity or the activities of others.	1. Shop foreman 2. Business Executive	1. Weight Training 2. Football 3. Gymnast	1. A weight training program is very often set up by the individual who will use the program. 2. A quarterback, when he makes a play call, is directing the activities of others. In the team operation, the quarterback has the opportunity to test himself in this situation of control. 3. A gymnast organizes a series of movements into a smooth flowing routine, which involves the planning of an entire activity.

TEMPERAMENTS

SITUATIONS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Involving the necessity of dealing with people in actual job duties beyond giving and receiving instructions.	1. Carpenter Partners 2. Plumbers 3. Curriculum Writing Workshops 4. Elementary School Principal	1. Team sports in general A. Football B. Baseball C. Basketball	1. In order to function effectively, any group (team) must rely on the ability of each individual member to deal with, work with, and cooperate with other members of the group. The quarterback on the football team has a different role from that of the center, however, both must be able to work together and without discord in order for the team as a whole to be successful.

TEMPERAMENTS

SITUATIONS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Involving working alone and apart in physical isolation from others, although the activity may be integrated with that of others.	1. Assembly Line Workers 2. Salesman Shippers Truckers working for one company	1. Gymnastics 2. Wrestling 3. Swimming 4. Track & Field 5. Football (to an extent) 6. Soccer 7. etc.	1. In individual sports, each member of the team has a task. Successful completion of that task is important to the whole team. For example, in gymnastics and swimming each member competes individually in his own event, but his score is important to total team score. 2. In team sports such as football or soccer, each player has a separate, individual task to complete. Unless this task is successfully completed, the efforts of the team as a whole will be unsuccessful. In soccer, the fullback works separately from the forward. However, both must complete their tasks. In football, each lineman and each back has a separate individual opponent. Again, failure to complete a single assignment can result in an unsuccessful play - offensively or defensively.

TEMPERAMENTS

SITUATIONS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Involving performing adequately under stress when confronted with the critical of unexpected, or when taking risks.	1. High Steel Construction	1. Gymnastics	1. Gymnastics, especially apparatus work involves a certain high degree of risk and danger. To be able to overcome the fear of the risk involved in a particular move or stunt is vitally necessary to success or failure.
	2. Bridge Painter	2. Individual Sports, in general	2. In individual sports (wrestling, track, golf, etc.) there is a high degree of stress involved. The athlete is competing strictly on his own ability, often against intangible criteria, as in gymnastics and diving, or against a clock or tape measure, as in track and field, or against a single opponent, as in wrestling, or against himself and others, as in golf. Many unexpected or critical factors can occur in some of these sports. (Opponent reactions and precarious situations in wrestling, for example). Overcoming the stress and pressure of the individual competition is imperative to success.
	3. Airline Pilot	3. Team Sports, in general	3. In team sports, everything the opposition does is unexpected and can become critical. This creates stress. Adapting to and meeting these situations is essential to team success.

TEMPERAMENTS

SITUATIONS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Involving the evaluation (arriving at generalizations, judgments or decisions) of information against sensory or judgmental criteria.	1. Airline Pilot 2. Truck Driver 3. Carpenter	1. Baseball and Softball 2. Rhythms and Dance 3. Tennis 4. Basketball 5. Officiating 6. etc.	1. In order to hit or catch a ball (in any activity), an individual must rely on the rapid evaluation of sensory information and criteria. Many factors must be considered befor an evaluation and response can be made - wind, speed, height, spin angle of flight, distance, etc. The task (hitting, catching) depends on the successful evaluation of these criteria (and a successful response! 2. Successul completion of dance forms relies on perception, evaluation and response to sensory stimuli. 3. Officiating demands evaluation and decision-making based almost solely on sensory and judgment criteria. Students should be encouraged to participate in activities of an officiating nature.

TEMPERAMENTS

SITUATIONS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Involving the evaluation (arriving at generalizations, judgments or decisions) of information against measurable or verifiable criteria.	1. Physician 2. Mechanic 3. Builder	1. Archery 2. Golf 3. Field events 4. Wrestling	(This situation differs from the preceding one (#9) in that it refers to concrete, objective information and criteria, while #9 referred to subjective, intangible information and criteria). Many physical education activities require scoring and score keeping based on measurement e.g. number of arrows in gold (10 puts. each); distance - as a broad jump, discuss throw or shot put; height - as a pole vault or high jump; number of golf strokes. Most activities are governed by rules - verifiable criteria and some, such as wrestling, even scored according to the evaluation and judgment of those rules.

TEMPERAMENTS

SITUATIONS From Dictionary of Occupational Titles (Vol. II, App. B, p. 654)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Situations involving the precise attainment of set limits, tolerances or standards.	1. Machinists 2. Mechanics 3. Carpenters 4. Draftsmen 5. Architects	1. Golf 2. Tennis 3. Badminton 4. Volleyball 5. etc.	In order to win in many physical education activities a certain number of points must be scored. For example, in tennis "winning" involves winning two sets, each set consisting of six games, each game being four "points" (which must be won by two "points"). In golf "par" is a set standard which the golfer strives to attain.

TEMPERAMENTS
(Continued)

Situations
(D.O.T., Vol. II, App. B, p. 654)

Involving influencing people in their opinions, attitudes or judgments about ideas or things.

Involving the interpretation of feelings, ideas or facts in terms of personal viewpoint.

These "situations" can be important to the conceptual maturation of young people, and are situations in which most people will at some time find themselves. A person must learn to interpret his own feelings and the feelings of those around him. He must also be somewhat receptive to the feelings, ideas and facts of other people and be able to assimilate these and apply them to his own personal point of view.

He will also, at some time, be in a situation where he will attempt to influence, be influenced by, or have someone attempt to influence him in various opinions, attitudes and judgments about ideas, philosophies, feelings, or facts. How he learns to adapt to these situations can be important to his emotional, psychological and sociological well-being.

In the physical education program, implementation of these situations is often dependent upon the guidance and influence of the teacher. Instruction can be verbalized, in small groups as specific situations suggest or as resultant tensions occur, or in large groups before or after such occurrences. Instruction can also take the form of a closely supervised situation wherein such occurrences are likely to occur.

There are many situations where young people have conflicts in attitudes, opinions, judgments, feelings, ideas and facts. Many of these situations are inherent in any type of competitive activity in which children of this age are involved. Again, the instructor is the key in helping young people to use these situations for their own growth and development and for finding the opportunity wherein they can identify and assess their own behavior in them.

IV. APTITUDES

Aptitudes are defined in the D.O.T. as "specific capacities and abilities required of an individual in order to learn or perform adequately a task or job duty." (Volume II, Appendix B, p. 653.)

In making a life choice of almost any type, an individual should be aware of his aptitudes and his degree of ability within these aptitudes.

Physical education activities offer an opportunity for evaluation of a wide range of aptitudes and abilities. Through exposure to, and experiences with, this range of aptitudes, an individual will have this opportunity for self-evaluation and, hopefully, be better able to direct his choices toward an area or areas in which he will find success and satisfaction.

The following group of charts will attempt to show a correlation between aptitudes in the world of work and aptitudes in physical education activities.

APTITUDES From Dictionary of Occupational Titles (Vol. II, App. B, p. 653)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Intelligence	All occupations - varying in degree	All physical education and athletic activities	Most physical education and athletic activities require intelligence. In some measure the degree of success at any activity is in direct proportion to the participant's intelligenc The more intelligent individual is better able to "catch on" or understand the totality of the activity. He can reason and make better judgments. He usually learns the require activity skills better and is able to apply these skills more effectively. His performance usually is efficient and consistant. Examples in physical education and athletics where success is directly dependent on the degree of intelligence can be readily seen. The quarterback seeing the defensive team set their defense will often change the play on the line of scrimmage seconds before play resumes. The center in basketball running down the court at a high rate of speed must decide what play should be initiated depending upon the location and number of opposing players, how much tim remains to get the shot off, as well as how much time remains in the game and what his coach wants him to do.

APTITUDES From Dictionary of Occupational Titles (Vol. II, App. B, p. 653)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Eye-Hand-Foot Coordination	1. Heavy equipment operators 2. Drivers, in general 3. Airline pilots	1. Most physical education and athletic activities	Eye-hand-foot coordination might be considered a specific attitude which, when combined with other skills such as balance or agility, make up the larger more complex aptitude of motor coordination. An example of eye-hand coordination would be playing handball or tennis. An example of eye-foot coordination would be kicking a football or soccerball.

APTITUDES From Dictionary of Occupational Titles (Vol. II, App. B, p. 653)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Manual Dexterity	1. Machinists 2. Assembly line workers 3. Skilled tradesmen	1. Bowling 2. Basketball 3. Tennis 4. Baseball	Manual dexterity is a prerequisite fo successful performance in numerous physical education or athletic events Bowling a strike, shooting a basket o making a tennis serve all require a high degree of manual dexterity. This aptitude is closely related to the aptitude of finger dexterity. However, finger dexterity involves more refined movements of smaller muscle groups. It should be noted that although there is a strong correlation between manual dexterity and finger dexterity it does not necessarily follow that the individual who possesses manual dexterity also possesses finger dexterity.

APTITUDES From Dictionary of Occupational Titles (Vol. II, App. B, p. 653)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Finger Dexterity	1. Watch makers 2. Jewelers 3. Computer Assemblers	1. Baseball pitcher 2. Football quarterback	It is difficult to illustrate examples of finger dexterity in physical education and athletic activities which closely parallel examples of this aptitude in the working world. Certainly the tactile sensations and manipulations of the fingers of the baseball pitcher when he throws a curve ball or of the quarterback when he passes the football are representative of finger dexterity and the success of the pitcher or the quarterback depend a great deal on his aptitude in this area.

APTITUDES From Dictionary of Occupational Titles (Vol. II, App. B, p. 653)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Motor Coordination	1. Construction Laborer 2. Assembly Workers 3. Drivers	1. Most physical education and athletic activities	Motor coordination or the ability to efficiently move one's body is a prerequisite aptitude for many jobs in the world of work as well as for most physical education and athletic activity. Without it, success in either area is highly unlikely. For example, the individual who cannot coordinate his entire body will probably experience failure when he attempts to do a shoulder roll on the parallel bars just as he probably will if he attempts to push a heavily loaded wheelbarrow up a wobbling plank. Activities in most physical education and athletic programs require the participant to possess total motor coordination. However, it would be beneficial for physical education teachers to show that motor coordination is not a single aptitude but rather a combination of coordination skills (eye-hand coordination, eye-foot coordination, kinesthetic sense, etc.) This explanation might assist the student to better understand the specific demands of the activity. It might increase the possibility of his success; it might reduce the disappointment of feelings of defeat if he does not excell or do well.

APTITUDES From Dictionary of Occupational Titles (Vol. II, App. B, p. 653)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Spatial	1. Engineer 2. Airline pilots 3. Draftsman	1. Gymnast 2. Diver 3. Field men	The ability to comprehend forms in space is required in gymnastics, diving and field events. For example, the gymnast about to perform a movement on the parallel bars must think through or "feel" the movement prior to the actual execution. Similarly, the diver moves through every movement of a dive before beginning the dive.

APTITUDES From Dictionary of Occupational Titles (Vol. II, App. B, p. 653)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Verbal	1. Attorney 2. Teacher 3. Journalist 4. Supervisor	1. Team sports, in general 2. Individual sports, in general	Verbal ability is a prerequisite in most physical education and athletic activities in order to understand instructions, rules, or game strategies in order to effectively communicate with teammates as game situations occur.

PHYSICAL DEMANDS

The nature of physical education automatically implies the existence of physical demands. Similarly, the nature of the term "work" automatically implies the existence of physical demands. The range of physical demands in the world of work is as wide as the large variety of occupations available. This range in physical education is not quite as wide. However, there are many different activities where children can experience a variety of physical demands necessary for participation in these activities. The following charts attempt to show the parallels between physical demands in the world of work as listed and described in the D.O.T. (Vol. II, Appendix B, pp. 654 and 655) and physical demands in physical education.

Working Conditions From Dictionary of Occupational Titles (Vol. II, App. B, pp 654,655)	Examples of jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Factors of Physical Demands			
Lifting, carrying, pushing, and/or pulling. (strength) Five degrees of physical demand: 1. Sedentary work 2. Light work 3. Medium work 4. Heavy work 5. Very heavy work	1. Accountant 2. Typesetter 3. Service Salesman 4. Farm Supervisor 5. Logger	1. Softball 2. Soccer 3. Football 4. Calisthenics 5. Gymnastic 6. Wrestling	The degrees of strength required in different physical education activities varies widely. Although there are extremely few activities which could be described as "sedentary" there are activities which cover the other four degrees as described is the D.O.T. Softball requires very little "strength" as such and does involve a certain amount of standing. Soccer, on the other hand, requires very little lifting, carrying, pushing or pulling, but does require a high degree of activity since running is a major factor. Calisthenics may require speed, endurance, agility and/or strength, and in varying degrees. Gymnastics and wrestling could be classified as very heavy work in that strength is a prime factor in success.

Working Conditions From Dictionary of Occupational Titles (Vol II, App B, pp 654, 655)	Examples of jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Factors of Physical Demands			
Climbing and/or Balancing	1. Fireman 2. Painter 3. Utilityman (for a power company) 4. High steel construction worker	1. Rope climbing 2. Gymnastics	Many activities in a gymnastic unit involve balance, agility and, to an extent, climbing, e.g. balance beam, parallel bars, or floor exercises

Working Conditions From Dictionary of Occupational Titles (Vol II, App B, pp 654, 655)	Examples of jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Factors of Physical Demands			
Stooping, kneeling, crouching, and/or crawling	1. Plumber 2. Carpenter 3. Roofer 4. Tile layer 5. Carpet layer	1. Wrestling 2. Locomotive relay races 3. Football	1. Wrestling takes place "on the mat", which would involve "kneeling and crawling," or "on the feet" which could be termed "stooping and crouching". 2. There are many types of relay races which can use stooping, crouching and crawling. 3. A good "stance" in football requires use of stooping, crouching, and to an extent, kneeling.

Working Conditions From Dictionary of Occupational Titles (Vol II, App B, pp 654, 655)	Examples of jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Factors of Physical Demands			
Reaching, handling, fingering and/or feeling	1. Carpenter 2. Truck loader 3. Fruit picker 4. Physician	1. Basketball 2. Wrestling 3. Softball 4. Football	1. In basketball, softball, and footbal reaching and handling are involved in catching and throwing. To some extent, fingering is involved in shooting a basketball, pitching a softball, or passing a football. 2. In wrestling, there is a great deal of seizing, holding, grasping, and turning, which is considered as "handling".

Working Conditions From Dictionary of Occupational Titles (Vol II, App B, pp. 654,655)	Examples of jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Factors of Physical Demands			
Talking and/or hearing	1. Salesman 2. Receptionist 3. Audio-engineer	1. Soccer 2. Basketball 3. Football 4. La-crosse	Most team sports require verbalization so that members of the team are better able to function together. Signal-calling and play-calling (used in many sports) requires hearing.

Working Conditions From Dictionary of Occupational Titles (Vol II, App B, pp. 654,655)	Examples of jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Factors of Physical Demands			
Seeing	1. Surveyor 2. Lab Technician 3. Fire Observer	Almost all physical education activities require visual acuity, depth perception and field of vision. 1. Football 2. Basketball 3. Soccer 4. La-crosse	Catching or hitting a ball, shooting or throwing at a target (a basketball net), throwing at a moving target, e.g. passing a football to a moving man down field, requires depth perception and visual acuity. Team work on a soccer team or basketball team requires knowing where everyone is, i.e., use of field vision.

WORKING CONDITIONS

In a well rounded physical education program, a child has the opportunity to experience many different types of "working conditions".

The D.O.T. defines working conditions as the "physical surroundings of a worker in a specific job". (D.O.T., Volume II, Appendix B, p. 656) It lists and defines the following seven work conditions:

1. inside, outside, and both
2. extremes of cold plus temperature changes
3. extremes of heat plus temperature changes
4. wet and humid
5. noise and vibration
6. hazards
7. fumes, odors, toxic conditions, dust and poor ventilation.

In the D.O.T. these conditions are described in extremes of severity. Although these extremes are not present in the typical physical education program, there are parallels through which children can experience many of these different conditions. This experience and the young person's preferential reaction may help make him more vocationally aware and able to use his preferences in the decision-making elements of occupational choice.

The following chart lists examples to show the parallels between physical education and work.

Working Conditions From Dictionary of Occupational Titles (Vol. II, App. B, p. 656)	Examples of Jobs in the World of Work	Examples of Activities in Physical Education and Athletics	Illustrations
Noise and vibration	Heavy construction Street Repair	Basketball Relay Races Mass Games	Although there is very minimal noise involved in most physical education activities, there is a certain degree of noise most of the time. Any class of 40-70 children, in any activity will result in noise. Basketball with dribbling, has a built-in "noise" factor.
Hazards	Fireman Bridgeworker	Gymnastics Football Body contact sports in general	An improperly performed gymnastics stunt may lead to bodily injury. A contact sport involves a certain degree of hazard and in some cases - football, la-crosse, hockey, soccer - there will be some "hurt" involved to some degree.
Fumes, odors, toxic Condition Dust, poor ventilation	Chemist Construction Worker Sawmill Worker	Football	In some physical education activities, a person can remain "clean". In others he will probably get "dirty". Most activities where contact with the ground is involved will result in a degree of dirtiness. Toxic conditions, smoky or vaporous fumes, noxious smells and odors and poor ventilation are conditions which are not usually present in our schools, gymnasiums and athletic fields. However, certain physical education activities and facilities do have their own peculiar "smell" (e.g. a locker room, a wrestling room, the pool, the gym.).

[illegible]	Factory Office etc.	Basketball Wrestling Gymnastics etc.	Many winter activities are basically inside with constant light, heat and ventilation.
Outside	Construction Surveying etc.	Softball Tennis Skiing etc.	Most fall, spring, and summer activitie are basically outside.
Extremes of Cold	Weather and Fire Station Observes Line Repairmen Snow Removal Men	Skiing Ice Skating etc.	Outdoor winter sports activities may often involve extremes of cold - variet of conditions, e.g. winds, storms.
Extremes of Heat	Boilerman Smelter	Football Wrestling	Outdoor sports may often involve extremes of heat depending on the activit and the season.
Wet and Humid	Marine Technology Plumber Seaman	Aquatics	In any aquatic activity, wetness is naturally inherent. Inside pool areas are usually extremely humid and warm.

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General References for Teachers pg 27-30

APPENDIX A

Occupations by Group Arrangement
from
MID-HUDSON OCCUPATIONAL MONOGRAPHS

CODE	PROFESSIONAL, TECHNICAL, MANAGERIAL	WT GROUP PAGE NO.
001.081	Architect	371
001.281	Draftsman, Architectural	377
003.081	Electrical Engineer	371
003.181	Electronic Technician	379
005.081	Civil Engineer	371
005.081	Sanitary Engineer	371
007.081	Mechanical Engineer	371
007.081	Tool Designer	371
007.181	Mechanical-Engineering Technician	379
007.281	Draftsman, Mechanical	377
008.081	Chemical Engineer	371
012.168	Systems Analyst, Business Electronic-Data Processing	375
012.188	Industrial Engineer	383
012.281	Air Analyst	418
013.081	Agricultural Engineer	371
018.188	Surveyor	385
018.281	Photogrammetrist	377
019.081	Landscape Architect	371
020.088	Mathematician	468
020.188	Actuary	468
020.188	Programer, Business	468
022.281	Chemical-Laboratory Technician	418
024.081	Geologist	466
029.281	Laboratory Tester I	418
040.081	Forester	466
040.081	Horticulturist	466
041.081	Marine Biologist	466
045.108	Counselor II	296
049.384	Biological Aid	413
070.108	General Practitioner	473
072.108	Dentist	473
073.108	Veterinarian	473
074.181	Pharmacist	418
075.128	Nurse, Staff, Public Health	333
075.378	Nurse, General Duty	477

CODE	OCCUPATIONAL TITLE	WT GROUP PAGE NO.
077.168	Dietitian	245
078.281	Medical Technologist	418
078.368	Dental Hygienist	477
078.368	Electrocardiograph Technician	477
078.368	Radiologic Technologist	477
078.381	Medical-Laboratory Assistant	418
078.381	Nuclear Medical Technologist	418
079.108	Chiropractor	473
079.108	Podiatrist	473
079.118	Sanitarian	237
079.128	Occupational Therapist	475
079.188	Industrial Hygienist	383
079.368	Inhalation Therapist	477
079.378	Dental Assistant	477
079.378	Nurse, Licensed Practical	477
079.378	Physical Therapist	477
079.378	Surgical Technician	477
091.228	Teacher, Secondary School	341
092.228	Teacher, Elementary School	343
096.128	County Home-Demonstration Agent	337
096.128	County-Agricultural Agent	337
096.128	Home Economist	337
097.228	Instructor, Vocational Training	337
100.168	Librarian	245
100.388	Medical-Record Librarian	276
110.108	Lawyer	425
132.268	Reporter	526
139.288	Writer, Technical Publications	387
141.081	Illustrator	232
142.051	Interior Designer and Decorator	228
142.081	Clothes Designer	232
142.081	Floral Designer	232
143.062	Photographer, Commercial	230
152.048	Musician, Instrumental	394
159.148	Announcer	400
160.188	Accountant	252
160.288	Estimator	383
161.268	Clerical Technician	248
162.158	Purchasing Agent	484
165.068	Public-Relations Man II	482

CODE	OCCUPATIONAL TITLE	WT GROUP PAGE NO.
166.088	Job Analyst	294
166.118	Manager, Personnel	237
166.268	Employment Interviewer I	250
168.168	Building Inspector	416
168.168	Manager, Credit and Collection	245
168.287	Food and Drug Inspector	420
168.288	Claim Examiner I	254
169.168	Administrative Assistant	245
186.118	Manager, Financial Institution	237
186.168	Manager, Insurance Office	245
186.288	Loan Officer	252
187.118	Superintendent, Hospital	237
187.168	Director, Funeral	245
187.168	Superintendent, Building II	245
191.287	Appraiser, Real Estate	420
193.168	Air-Traffic-Control Specialist, Tower	261
195.108	Caseworker	296
195.168	Community Organization Worker	245
195.208	Case Aid	296
195.228	Recreation Leader	345
196.283	Airplane Pilot, Commerical	422
199.168	Urban Planner	237

CLERICAL & SALES

201.368	Medical Secretary	263
201.368	Secretary	263
202.388	Court Reporter	278
202.388	Stenographer	278
203.588	Typist	287
204.388	Sales Correspondent	256
206.388	File Clerk I	277
208.588	Transcribing-Machine Operator	287
209.388	Clerk-Typist	276
209.588	Clerk, General	289
209.688	Proofreader I	289
210.388	Bookkeeper I	280
211.468	Cashier II	269
212.368	Teller	267
213.382	Digital-Computer Operator	274
213.582	Key-Punch Operator	274
213.782	Tabulating-Machine Operator	435
215.388	Bookkeeping-Machine Operator I	280

CODE	OCCUPATIONAL TITLE	WT GROUP PAGE NO.
215.488	Pay-Roll Clerk	280
217.388	Proof-Machine Operator	280
219.388	Coding Clerk	276
219.388	Ward Clerk	280
219.488	Accounting Clerk	280
221.168	Material Coordinator	261
222.387	Shipping and Receiving Clerk	271
223.387	Tape Librarian	271
233.388	Mail Carrier	276
235.862	Telephone Operator	291
237.368	Receptionist	258
239.588	Meter Reader	289
241.168	Claim Adjuster	416
242.368	Hotel Clerk	265
242.368	Travel Clerk	258
243.368	Service Clerk	265
249.268	Survey Worker	250
249.368	Claims Clerk	258
249.368	Credit Clerk I	258
249.368	Library Assistant	258
250.258	Salesman, Insurance	488
250.358	Salesman, Real Estate	488
251.258	Salesman, Securities	488
258.358	Salesman, Advertising	488
280.358	Salesman, Automobile	488
282.358	Salesperson, Hearing Aids	488
289.358	Salesman, General	488
289.358	Salesperson, Parts	488
290.478	Sales Clerk	501
292.358	Salesman-Driver	488
297.868	Model	408
299.287	Pest-Control Representative, Structural	420
299.381	Carpet Layer	312

SERVICE OCCUPATIONS

CODE	OCCUPATIONAL TITLE	WT GROUP PAGE NO.
310.868	Hostess, Restaurant or Coffee Shop	505
311.878	Waiter (Waitress), Informal	507
312.878	Bartender	507
313.131	Chef	299
314.381	Cook, Short Order	310
314.781	Cook, Specialty	319
316.884	Meat Cutter	322

CODE	OCCUPATIONAL TITLE	WT GROUP PAGE NO.
319.138	Food-Service Supervisor	461
323.887	Maid II	360
330.371	Barber	499
332.271	Cosmetologist	499
338.381	Embalmer	312
352.878	Airplane Stewardess (Steward)	507
355.878	Nurse Aid	479
355.878	Orderly	479
355.878	Psychiatric Aid	479
356.874	Animal Caretaker	511
356.874	Stableman	511
359.878	Teacher, Nursery School	479
362.782	Dry Cleaner	435
363.782	Presser, Machine	435
365.381	Shoe Repairman	312
372.168	Guard, Chief	416
372.868	Correction Officer	427
373.884	Fire Fighter	322
375.168	Special Agent, F.B.I.	416
375.268	Detective	416
375.268	Patrolman	416
375.268	State-Highway Patrolman	416
376.868	Store Detective	427
379.168	Fish and Game Warden	416

FARMING, FISHERY, FORESTRY

CODE	OCCUPATIONAL TITLE	WT GROUP PAGE NO.
404.883	Farm Hand, Fruit I	444
406.168	Nurseryman	245
407.884	Grounds Keeper	322
409.168	Manager, Farm	245
409.181	Tree Surgeon	411
409.883	Farm-Equipment Operator	444
411.884	Farm Hand, Dairy I	322

PROCESSING OCCUPATIONS

CODE	OCCUPATIONAL TITLE	WT GROUP PAGE NO.
500.380	Plater	430
519.887	Foundry Worker, General	360
521.885	Cellarman	447
522.782	Smoker	435
526.781	Baker	319
529.381	Cheesemaker	312
529.782	Freezer Man	435
556.782	Injection-Molding-Machine Operator	435
582.886	Dye-House Worker	356

CODE	OCCUPATIONAL TITLE	WT GROUP PAGE NO.
	MACHINE TRADES OCCUPATIONS	
600.280	Machinist I	430
601.280	Tool-And-Die Maker	430
604.380	Turret-Lathe Set-Up Operator	430
604.885	Screw-Machine Operator, Production	447
606.782	Drill-Press Operator, Production	435
609.380	Engine-Lathe Set-Up Operator	430
609.782	Tape-Control Machine Operator	435
609.884	Laborer, General	322
609.885	Production-Machine Operator	447
620.281	Automobile Mechanic	312
620.281	Construction-Equipment Mechanic	312
620.281	Test Driver I	312
620.381	Automobile-Radiator Man	312
621.281	Aircraft-And-Engine Mechanic	312
624.281	Farm-Equipment Mechanic I	312
625.281	Diesel Mechanic	312
625.281	Gasoline-Engine Repairman	312
633.281	Office-Machine Serviceman	312
637.281	Refrigeration Mechanic	312
638.281	Maintenance Mechanic II	312
638.281	Millwright	312
639.381	Vending-Machine Repairman	312
643.885	Bindery Worker	447
651.782	Cylinder-Press Man	435
651.782	Offset Pressman	435
653.687	Collator	282
660.280	Cabinetmaker	430
669.782	Woodworking-Machine Operator	435
699.782	Die Cutter	435
699.782	Slitting-Machine Operator I	435
	BENCH WORK OCCUPATIONS	
700.281	Jeweler	312
704.884	Etched-Circuit Processor	322
705.884	Polisher	322
706.884	Assembler, Small Parts	322
709.281	Locksmith	312
710.281	Electromechanical Technican	312
710.281	Instrument Repairman I	312
712.281	Orthopedic-Appliance-And-Limb Technician	312
712.381	Dental-Laboratory Technician	312
713.251	Optician, Dispensing	486

CODE	OCCUPATIONAL TITLE	WT GROUP PAGE NO.
715.281	Watchmaker	312
720.281	Television Service-And-Repairman	312
726.687	Inspector, Components	282
726.781	Electronics Assembler	319
726.884	Cable Maker	322
726.884	Module Assembler	322
729.884	Repairman, Switchgear	322
731.887	Toy Assembler, Plastic	360
741.884	Painter, Spray I	322
763.381	Furniture Finisher	312
780.381	Furniture Upholsterer	312
781.884	Cutter, Machine I	322
785.261	Master Tailor	308
786.782	Sewing-Machine Operator, Regular Equipment	435
789.687	Garment Inspector	282

STRUCTURAL WORK OCCUPATIONS

CODE	OCCUPATIONAL TITLE	WT GROUP PAGE NO.
801.781	Structural-Steel Worker	319
804.281	Sheet-Metal Worker	312
806.887	Assembler, Automobile	360
807.381	Automobile-Body Repairman	312
812.884	Welder, Combination	322
821.381	Lineman	312
822.281	Central Office Repairman	312
822.381	Private-Branch-Exchange Installer	312
822.381	Station Installer	312
823.884	Antenna Installer	322
824.281	Electrician	312
827.281	Electrical-Appliance Serviceman	312
828.281	Electronics Mechanic	312
829.281	Pinsetter Mechanic, Automatic	312
829.381	Cable Splicer	312
840.781	Painter	319
841.781	Paperhanger	319
842.781	Lather	319
842.781	Plasterer	319
842.884	Taper	322
844.884	Cement Mason	322
859.782	Driller, Water Well	435
859.883	Operating Engineer	444
860.381	Carpenter	312
860.887	Laborer, Carpentry	360

CODE	OCCUPATIONAL TITLE	WT GROUP PAGE NO.
861.381	Bricklayer	312
861.781	Tile Setter	319
862.281	Oil-Burner-Installation-And-Serviceman	312
862.381	Plumber	312
863.884	Sider	322
865.781	Glazier	319
866.381	Roofer	312
869.281	Furnace Installer-And-Repairman, Hot Air	312
869.887	Construction Worker II	360
899.281	Diver	312
899.381	Maintenance Man, Building	312

MISCELLANEOUS OCCUPATIONS

CODE	OCCUPATIONAL TITLE	WT GROUP PAGE NO.
905.883	Truck Driver, Heavy	444
913.463	Bus Driver	519
913.883	Ambulance Driver	444
915.867	Automobile-Service-Station Attendant	503
919.168	Dispatcher, Motor Vehicle	261
922.883	Industrial-Truck Operator	444
922.887	Laborer, Stores	360
950.782	Stationary Engineer	435
954.782	Water-Treatment-Plant Operator	435
957.382	Control-Room Man	516
970.381	Painter, Sign	312
971.382	Photographer, Photoengraving	514
973.381	Compositor I	312
979.782	Blueprinting-Machine Operator	435

APPENDIX B

Occupations by Work Areas
from
MID-HUDSON OCCUPATIONAL MONOGRAPHS

PAGE NO. VOL. II, DOT	ART	OCCUPATIONAL CODE NUMBER
228	Decorating and Art Work	
	INTERIOR DESIGNER AND DECORATOR	142.051
230	Photography and Motion Picture Camera Work	
	PHOTOGRAPHER, COMMERCIAL	143.062
232	Art Work	
	CLOTHES DESIGNER	142.081
	FLORAL DESIGNER	142.081
	ILLUSTRATOR	141.081
	BUSINESS RELATIONS	
237	Administration	
	MANAGER, FINANCIAL INSTITUTION	186.118
	MANAGER, PERSONNEL	166.118
	SANITARIAN	079.118
	SUPERINTENDENT, HOSPITAL	187.118
	URBAN PLANNER	199.168
245	Managerial Work	
	ADMINISTRATIVE ASSISTANT	169.168
	COMMUNITY ORGANIZATION WORKER	195.168
	DIETITIAN	077.168
	DIRECTOR, FUNERAL	187.168
	LIBRARIAN	100.168
	MANAGER, CREDIT AND COLLECTION	168.168
	MANAGER, FARM	409.168
	MANAGER, INSURANCE OFFICE	186.168
	NURSERYMAN	406.168
	SUPERINTENDENT, BUILDING II	187.168
248	Consultative and Business Services	
	CLERICAL TECHNICIAN	161.268
250	Interviewing, Information-Giving, and Related Work (Vocational, Educational, and Related Activities)	
	EMPLOYMENT INTERVIEWER I	166.268
	SURVEY WORKER	249.268
252	Accounting, Auditing, and Related Work	
	ACCOUNTANT	160.188
	LOAN OFFICER	186.288

PAGE NO. VOL. II, DOT	BUSINESS RELATIONS (continued)	OCCUPATIONAL CODE NUMBER
254	Title and Contract Search and Analysis and Related Work	
	CLAIM EXAMINER I	168.288
256	Corresponding and Related Work	
	SALES CORRESPONDENT	204.388
258	Information Gathering, Dispensing, Verifying, and Related Work	
	CLAIMS CLERK	249.368
	CREDIT CLERK I	249.368
	LIBRARY ASSISTANT	249.368
	RECEPTIONIST	237.368
	TRAVEL CLERK	242.368
	CLERICAL WORK	
261	Scheduling, Dispatching, Expediting, and Related Work	
	AIR-TRAFFIC-CONTROL SPECIALIST, TOWER	193.168
	DISPATCHER, MOTOR VEHICLE	919.168
	MATERIAL COORDINATOR	221.168
263	Secretarial and Related Work	
	MEDICAL SECRETARY	201.368
	SECRETARY	201.368
265	Facilities, Services, and Movement Allocating and Expediting Work	
	HOTEL CLERK	242.368
	SERVICE CLERK	243.368
267	Paying and Receiving (Banks and Other Establishments)	
	TELLER	212.368
269	Cashiering (Drug Stores, Theaters, Restaurants and Related Establishments)	
	CASHIER II	211.468
271	Inspecting and Stock Checking	
	SHIPPING AND RECEIVING CLERK	222.387
	TAPE LIBRARIAN	223.387
274	Typesetting, Reproducing, and Related Machine Work	
	DIGITAL-COMPUTER OPERATOR	213.382
	KEY-PUNCH OPERATOR	213.582

PAGE NO. VOL. II, DOT	CLERICAL WORK (continued)	OCCUPATIONAL CODE NUMBER
276	Classifying, Filing, and Related Work	
	CLERK-TYPIST	209.388
	CODING CLERK	219.388
	FILE CLERK I	206.388
	MAIL CARRIER	233.388
	MEDICAL-RECORD LIBRARIAN	100.388
278	Stenographic and Related Work	
	COURT REPORTER	202.388
	STENOGRAPHER	202.388
280	Computing and Related Recording	
	ACCOUNTING CLERK	219.488
	BOOKKEEPER I	210.388
	BOOKKEEPING-MACHINE OPERATOR I	215.388
	PAY-ROLL CLERK	215.488
	PROOF-MACHINE OPERATOR	217.388
	WARD CLERK	219.388
282	Sorting, Inspecting, Measuring and Related Work	
	COLLATOR	653.687
	GARMENT INSPECTOR	789.687
	INSPECTOR, COMPONENTS	726.687
287	Typing and Related Recording	
	TRANSCRIBING-MACHINE OPERATOR	208.588
	TYPIST	203.588
289	Routine Checking and Recording	
	CLERK, GENERAL	209.588
	METER READER	239.588
	PROOFREADER I	209.688
291	Switchboard Service	
	TELEPHONE OPERATOR	235.862

COUNSELING, GUIDANCE, AND SOCIAL WORK

294	Social Science, Psychological, and Related Research	
	JOB ANALYST	166.088
296	Guidance and Counseling	
	CASE AID	195.208
	CASEWORKER	195.108
	COUNSELOR II	045.108

CRAFTS

299	Supervisory Work (Farming, Logging, Manufacturing, Processing, Construction, Transportation and Related Activities)	
	CHEF	313.131

PAGE NO. VOL. II, DOT	CRAFTS (continued)	OCCUPATIONAL CODE NUMBER
308	Costuming, Tailoring, and Dressmaking	
	MASTER TAILOR	785.261
310	Cooking and Related Work	
	COOK, SHORT ORDER	314.381
312	Craftsmanship and Related Work	
	AIRCRAFT-AND-ENGINE MECHANIC	621.281
	AUTOMOBILE-BODY REPAIRMAN	807.381
	AUTOMOBILE MECHANIC	620.281
	AUTOMOBILE-RADIATOR MAN	620.381
	BRICKLAYER	861.381
	CABLE SPLICER	829.381
	CARPENTER	860.381
	CARPET LAYER	299.381
	CENTRAL OFFICE REPAIRMAN	822.281
	CHEESEMAKER	529.381
	COMPOSITOR I	973.381
	CONSTRUCTION-EQUIPMENT MECHANIC	620.281
	DENTAL-LABORATORY TECHNICIAN	712.381
	DIESEL MECHANIC	625.281
	DIVER	899.281
	ELECTRICAL-APPLIANCE SERVICEMAN	827.281
	ELECTRICIAN	824.281
	ELECTROMECHANICAL TECHNICIAN	710.281
	ELECTRONICS MECHANIC	828.281
	EMBALMER	338.381
	FARM-EQUIPMENT MECHANIC I	624.281
	FURNACE INSTALLER-AND-REPAIRMAN, HOT AIR	869.281
	FURNITURE FINISHER	763.381
	FURNITURE UPHOLSTERER	780.381
	GASOLINE-ENGINE REPAIRMAN	625.281
	INSTRUMENT REPAIRMAN I	710.281
	JEWELER	700.281
	LINEMAN	821.381
	LOCKSMITH	709.281
	MAINTENANCE MAN, BUILDING	899.381
	MAINTENANCE MECHANIC II	638.281
	MILLWRIGHT	638.281
	OFFICE-MACHINE SERVICEMAN	633.281
	OIL-BURNER-INSTALLATION-AND-SERVICEMAN	862.281
	ORTHOPEDIC-APPLIANCE-AND-LIMB TECHNICIAN	712.281
	PAINTER, SIGN	970.381
	PINSETTER MECHANIC, AUTOMATIC	829.281
	PLUMBER	862.381
	PRIVATE-BRANCH-EXCHANGE INSTALLER	822.381
	REFRIGERATION MECHANIC	637.281
	ROOFER	866.381
	SHEET-METAL WORKER	804.281
	SHOE REPAIRMAN	365.381
	STATION INSTALLER	822.381
	TELEVISION SERVICE-AND-REPAIRMAN	720.281
	TEST DRIVER I	620.281
	VENDING-MACHINE REPAIRMAN	639.381
	WATCHMAKER	715.281

PAGE NO. VOL. II, DOT	CRAFTS (continued)	OCCUPATIONAL CODE NUMBER
319	Precision Working	
	BAKER	526.781
	COOK, SPECIALTY	314.781
	ELECTRONICS ASSEMBLER	726.781
	GLAZIER	865.781
	LATHER	842.781
	PAINTER	840.781
	PAPERHANGER	841.781
	PLASTERER	842.781
	STRUCTURAL-STEEL WORKER	801.781
	TILE SETTER	861.781
322	Manipulating	
	ANTENNA INSTALLER	823.884
	ASSEMBLER, SMALL PARTS	706.884
	CABLE MAKER	726.884
	CEMENT MASON	844.884
	CUTTER, MACHINE I	781.884
	ETCHED-CIRCUIT PROCESSOR	704.884
	FARM HAND, DAIRY I	411.884
	FIRE FIGHTER	373.883
	GROUNDS KEEPER	407.884
	LABORER, GENERAL	609.884
	MEAT CUTTER	316.884
	MODULE ASSEMBLER	726.884
	PAINTER, SPRAY I	741.884
	POLISHER	705.884
	REPAIRMAN, SWITCHGEAR	729.884
	SIDER	863.884
	TAPER	842.884
	WELDER, COMBINATION	812.884

EDUCATION AND TRAINING

333	Supervisory and Instructive Work (Nursing and Related Services)	
	NURSE, STAFF, PUBLIC HEALTH	075.128
337	Vocational Education	
	COUNTY-AGRICULTURAL AGENT	096.128
	COUNTY HOME-DEMONSTRATION AGENT	096.128
	HOME ECONOMIST	096.128
	INSTRUCTOR, VOCATIONAL TRAINING	097.228
341	High School, College, University, and Related Education	
	TEACHER, SECONDARY SCHOOL	091.228
343	Kindergarten, Elementary School, and Related Education	
	TEACHER, ELEMENTARY SCHOOL	092.228
345	Miscellaneous Instructive Work	
	RECREATION LEADER	195.228

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356	Feeding-Offbearing	
	DYE-HOUSE WORKER	582.886
360	Handling	
	ASSEMBLER, AUTOMOBILE	806.887
	CONSTRUCTION WORKER II	869.887
	FOUNDRY WORKER, GENERAL	519.887
	LABORER, CARPENTRY	860.887
	LABORER, STORES	922.887
	MAID II	323.887
	TOY ASSEMBLER, PLASTIC	731.887
	ENGINEERING	
371	Engineering Research and Design	
	AGRICULTURAL ENGINEER	013.081
	ARCHITECT	001.081
	CHEMICAL ENGINEER	008.081
	CIVIL ENGINEER	005.081
	ELECTRICAL ENGINEER	003.081
	LANDSCAPE ARCHITECT	019.081
	MECHANICAL ENGINEER	007.081
	SANITARY ENGINEER	005.081
	TOOL DESIGNER	007.081
375	Engineering, Scientific and Technical Coordination	
	SYSTEMS ANALYST, BUSINESS ELECTRONIC-DATA PROCESSING	012.168
377	Drafting and Related Work	
	DRAFTSMAN, ARCHITECTURAL	001.281
	DRAFTSMAN, MECHANICAL	007.281
	PHOTOGRAMMETRIST	018.281
379	Technical Work, Engineering and Related Fields	
	ELECTRONIC TECHNICIAN	003.181
	MECHANICAL-ENGINEERING TECHNICIAN	007.181
383	Industrial Engineering and Related Work	
	ESTIMATOR	160.288
	INDUSTRIAL ENGINEER	012.188
	INDUSTRIAL HYGIENIST	079.188
385	Surveying, Prospecting, and Related Work	
	SURVEYOR	018.188
387	Technical Writing and Related Work	
	WRITER, TECHNICAL PUBLICATIONS	139.288
	ENTERTAINMENT	
394	Musical Work, Instrumental	
	MUSICIAN, INSTRUMENTAL	152.048

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400	Radio Announcing and Related Work	
	ANNOUNCER	159.148
408	Modeling and Related Work	
	MODEL	297.868

FARMING, FISHING, AND FORESTRY

411	Cropping, Animal Farming, Gardening, and Related Work	
	TREE SURGEON	409.181
413	Technical Work, Science and Related Fields	
	BIOLOGICAL AID	049.384

INVESTIGATING, INSPECTING, AND TESTING

416	Investigating, Protecting & Related Work	
	BUILDING INSPECTOR	168.168
	CLAIM ADJUSTER	241.168
	DETECTIVE	375.268
	FISH AND GAME WARDEN	379.168
	GUARD, CHIEF	372.168
	PATROLMAN	375.268
	SPECIAL AGENT, F.B.I	375.168
	STATE-HIGHWAY PATROLMAN	375.268
418	Materials Analysis and Related Work	
	AIR ANALYST	012.281
	CHEMICAL-LABORATORY TECHNICIAN	022.281
	LABORATORY TESTER I	029.281
	MEDICAL-LABORATORY ASSISTANT	078.381
	MEDICAL TECHNOLOGIST	078.281
	NUCLEAR MEDICAL TECHNOLOGIST	078.381
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420	Appraising and Investigating Work	
	APPRAISER, REAL ESTATE	191.287
	FOOD AND DRUG INSPECTOR	168.287
	PEST-CONTROL REPRESENTATIVE, STRUCTURAL	299.287
422	Transporting and Test Driving	
	AIRPLANE PILOT, COMMERCIAL	196.283

LAW AND LAW ENFORCEMENT

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	CORRECTION OFFICER	372.868
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435	Operating-Controlling	
	BLUEPRINTING-MACHINE OPERATOR	979.782
	CYLINDER-PRESS MAN	651.782
	DIE CUTTER	699.782
	DRILLER, WATER WELL	859.782
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	TAPE-CONTROL MACHINE OPERATOR	609.782
	WATER-TREATMENT-PLANT OPERATOR	954.782
	WOODWORKING-MACHINE OPERATOR	669.782
444	Driving-Operating	
	AMBULANCE DRIVER	913.883
	FARM-EQUIPMENT OPERATOR	409.883
	FARM HAND, FRUIT I	404.883
	INDUSTRIAL-TRUCK OPERATOR	922.883
	OPERATING ENGINEER	859.883
	TRUCK DRIVER, HEAVY	905.883
447	Tending	
	BINDERY WORKER	643.885
	CELLARMAN	521.885
	PRODUCTION-MACHINE OPERATOR	609.885
	SCREW-MACHINE OPERATOR, PRODUCTION	604.885
	MANAGERIAL AND SUPERVISORY WORK	
461	Supervisory Work (Service and Related Activities)	
	FOOD-SERVICE SUPERVISOR	319.138
	MATHEMATICS AND SCIENCE	
466	Scientific Research	
	FORESTER	040.081
	GEOLOGIST	024.081
	HORTICULTURIST	040.081

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468	Mathematics, Physical Sciences, and Related Research	
	ACTUARY	020.188
	MATHEMATICIAN	020.088
	PROGRAMMER, BUSINESS	020.188

MEDICINE AND HEALTH

473	Medical, Veterinary, and Related Services	
	CHIROPRACTOR	079.108
	DENTIST	072.108
	GENERAL PRACTITIONER	070.108
	PODIATRIST	079.108
	VETERINARIAN	073.108
475	Therapeutic and Related Work	
	OCCUPATIONAL THERAPIST	079.128
477	Nursing, X-ray, and Related Services	
	DENTAL ASSISTANT	079.378
	DENTAL HYGIENIST	078.368
	ELECTROCARDIOGRAPH TECHNICIAN	078.368
	INHALATION THERAPIST	079.368
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	NURSE, GENERAL DUTY	075.378
	NURSE, LICENSED PRACTICAL	079.378
	RADIOLOGIC TECHNOLOGIST	078.368
	SURGICAL TECHNICIAN	079.378
479	Child and Adult Care	
	NURSE AID	355.878
	ORDERLY	355.878
	PSYCHIATRIC AID	355.878
	TEACHER, NURSERY SCHOOL	359.878

MERCHANDISING

482	Promotion and PUBLICITY	
	PUBLIC-RELATIONS MAN II	165.068
484	Purchase and Sales Work	
	PURCHASING AGENT	162.158
486	Sales and Service Work	
	OPTICIAN, DISPENSING	713.251
488	Demonstration and Sales Work	
	SALESMAN, ADVERTISING	258.358
	SALESMAN, AUTOMOBILE	280.358
	SALESMAN - DRIVER	292.358
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	SALESMAN, INSURANCE	250.258

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	SALESMAN, REAL ESTATE	250.358
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PERSONAL SERVICE

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507	Miscellaneous Personal Service Work (Food Serving, Portering, Valeting and Related Activities	
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PHOTOGRAPHY AND COMMUNICATIONS

514	Motion Picture Projecting, Photographic Machine Work, and Related Activities	
	PHOTOGRAPHER, PHOTOENGRAVING	971.382
516	Radio and Television Transmitting and Receiving	
	CONTROL - ROOM MAN	957.382

TRANSPORTATION

519	Transportation Service Work	
	BUS DRIVER	913.463
526	News Reporting and Related Work	
	REPORTER	132.268

APPENDIX C

Appendix A & B from Dictionary of Occupational Titles

D.O.T. APPENDIX A

Explanation of Relationships Within Data, People, Things Hierarchies

Much of the information in this edition of the Dictionary is based on the premise that every job requires a worker to function in relation to Data, People, and Things, in varying degrees. These relationships are identified and explained below. They appear in the form of three hierarchies arranged in each instance from the relatively simple to the complex in such a manner that each successive relationship includes those that are simpler and excludes the more complex.[1] The identifications attached to these relationships are referred to as worker functions, and provide standard terminology for use in summarizing exactly what a worker does on the job by means of one or more meaningful verbs.

A job's relationship to Data, People, and Things can be expressed in terms of the highest appropriate function in each hierarchy to which the worker has an occupationally significant relationship, and these functions taken together indicate the total level of complexity at which he must perform. The last three digits of the occupational code numbers in the Dictionary reflect significant relationships to Data, People, and Things, respectively.[2] These last three digits express a job's relationship to Data, People, and Things by identifying the highest appropriate function in each hierarchy to which the job requires the worker to have a significant relationship, as reflected by the following table:

	DATA (4th digit)	PEOPLE (5th digit)	THINGS (6th digit)
0	Synthesizing	Mentoring	Setting-Up
1	Coordinating	Negotiating	Precision Working
2	Analyzing	Instructing	Operating-Controlling
3	Compiling	Supervising	Driving-Operating
4	Computing	Diverting	Manipulating
5	Copying	Persuading	Tending
6	Comparing	Speaking-Signaling	Feeding-Offbearing
7	No significant relationship	Serving	Handling
8		No significant relationship	No significant relationship

DATA: Information, knowledge, and conceptions, related to data, people, or things, obtained by observation, investigation, interpretation, visualization, mental creation; incapable of being touched; written data take the form of numbers, words, symbols; other data are ideas, concepts, oral verbalization.

0 **Synthesizing:** Integrating analyses of data to discover facts and/or develop knowledge concepts or interpretations.

1 **Coordinating:** Determining time, place, and sequence of operations or action to be taken on the basis of analysis of data; executing determinations and/or reporting on events.

2 **Analyzing:** Examining and evaluating data. Presenting alternative actions in relation to the evaluation is frequently involved.

3 **Compiling:** Gathering, collating, or classifying information about data, people, or things. Reporting and/or carrying out a prescribed action in relation to the information is frequently involved.

4 **Computing:** Performing arithmetic operations and reporting on and/or carrying out a prescribed action in relation to them. Does not include counting.

5 **Copying:** Transcribing, entering, or posting data.

6 **Comparing:** Judging the readily observable functional, structural, or compositional characteristics (whether similar to or divergent from obvious standards) of data, people, or things.

PEOPLE: Human beings; also animals dealt with on an individual basis as if they were human.

0 **Mentoring:** Dealing with individuals in terms of their total personality in order to advise, counsel, and/or guide them with regard to problems that may be resolved by legal, scientific, clinical, spiritual, and/or other professional principles.

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[1] As each of the relationships to People represents a wide range of complexity, resulting in considerable overlap among occupations, their arrangement is somewhat arbitrary and can be considered a hierarchy only in the most general sense.

[2] Only those relationships which are occupationally significant in terms of the requirements of the job are reflected in the code numbers. The incidental relationships which every worker has to Data, People, and Things, but which do not seriously affect successful performance of the essential duties of the job, are not reflected.

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1 **Negotiating:** Exchanging ideas, information, and opinions with others to formulate policies and programs and/or arrive jointly at decisions, conclusions, or solutions.

2 **Instructing:** Teaching subject matter to others, or training others (including animals) through explanation, demonstration, and supervised practice; or making recommendations on the basis of technical disciplines.

3 **Supervising:** Determining or interpreting work procedures for a group of workers, assigning specific duties to them, maintaining harmonious relations among them, and promoting efficiency.

4 **Diverting:** Amusing others.

5 **Persuading:** Influencing others in favor of a product, service, or point of view.

6 **Speaking-Signaling:** Talking with and/or signaling people to convey or exchange information. Includes giving assignments and/or directions to helpers or assistants.

7 **Serving:** Attending to the needs or requests of people or animals or the expressed or implicit wishes of people. Immediate response is involved.

THINGS: Inanimate objects as distinguished from human beings; substances or materials; machines, tools, equipment; products. A thing is tangible and has shape, form, and other physical characteristics.

0 **Setting Up:** Adjusting machines or equipment by replacing or altering tools, jigs, fixtures, and attachments to prepare them to perform their functions, change their performance, or restore their proper functioning if they break down. Workers who set up one or a number of machines for other workers or who set up and personally operate a variety of machines are included here.

1 **Precision Working:** Using body members and/or tools or work aids to work, move, guide, or place objects or materials in situations where ultimate responsibility for the attainment of standards occurs and selection of appropriate tools, objects, or materials, and the adjustment of the tool to the task require exercise of considerable judgment.

2 **Operating-Controlling:** Starting, stopping, controlling, and adjusting the progress of machines or equipment designed to fabricate and/or process objects or materials. Operating machines involves setting up the machine and adjusting the machine or material as the work progresses. Controlling equipment involves observing gages, dials, etc., and turning valves and other devices to control such factors as temperature, pressure, flow of liquids, speed of pumps, and reactions of materials. Setup involves several variables and adjustment is more frequent than in tending.

3 **Driving-Operating:** Starting, stopping, and controlling the actions of machines or equipment for which a course must be steered, or which must be guided, in order to fabricate, process, and/or move things or people. Involves such activities as observing gages and dials; estimating distances and determining speed and direction of other objects; turning cranks and wheels; pushing clutches or brakes; and pushing or pulling gear lifts or levers. Includes such machines as cranes, conveyor systems, tractors, furnace charging machines, paving machines and hoisting machines. Excludes manually powered machines, such as handtrucks and dollies; and power assisted machines, such as electric wheelbarrows and handtrucks.

4 **Manipulating:** Using body members, tools, or special devices to work, move, guide, or place objects or materials. Involves some latitude for judgment with regard to precision attained and selecting appropriate tool, object, or material, although this is readily manifest.

5 **Tending:** Starting, stopping, and observing the functioning of machines and equipment. Involves adjusting materials or controls of the machine, such as changing guides, adjusting timers and temperature gages, turning valves to allow flow of materials, and flipping switches in response to lights. Little judgment is involved in making these adjustments.

6 **Feeding-Offbearing:** Inserting, throwing, dumping, or placing materials in or removing them from machines or equipment which are automatic or tended or operated by other workers.

7 **Handling:** Using body members, handtools, and/or special devices to work, move, or carry objects or materials. Involves little or no latitude for judgment with regard to attainment of standards or in selecting appropriate tool, object, or material.

NOTE: Included in the concept of Feeding-Offbearing, Tending, Operating-Controlling, and Setting Up, is the situation in which the worker is actually part of the setup of the machine, either as the holder and guider of the material or holder and guider of the tool.

S Sedentary Work

Lifting 10 lbs. maximum and occasionally lifting and/or carrying such articles as dockets, ledgers, and smal tools. Although a sedentary job is defined as one which involves sitting, a certain amount of walking and standing is often necessary in carrying out job duties. Jobs are sedentary if walking and standing are required only occasionally and other sedentary criteria are met.

L Light Work

Lifting 20 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 10 lbs. Even though the weight lifted may be only a negligible amount, a job is in this category when it requires walking or standing to a significant degree, or when it involves sitting most of the time with a degree of pushing and pulling of arm and/or leg controls.

M Medium Work

Lifting 50 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 25 lbs.

H Heavy Work

Lifting 100 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 50 lbs.

V Very Heavy Work

Lifting objects in excess of 100 lbs. with frequent lifting and/or carrying of objects weighing 50 lbs. or more.

2 **Climbing and/or Balancing:**

(1) Climbing: Ascending or descending ladders, stairs, scaffolding, ramps, poles, ropes, and the like, using the feet and legs and/or hands and arms.

(2) Balancing: Maintaining body equilibrium to prevent falling when walking, standing, crouching, or running on narrow, slippery, or erratically moving surfaces; or maintaining body equilibrium when performing gymnastic feats.

3 **Stooping, Kneeling, Crouching, and/or Crawling:**

(1) Stooping: Bending the body downward and forward by bending the spine at the waist.
(2) Kneeling: Bending the legs at the knees to come to rest on the knee or knees.
(3) Crouching: Bending the body downward and forward by bending the legs and spine.
(4) Crawling: Moving about on the hands and knees or hands and feet.

4 **Reaching, Handling, Fingering, and/or Feeling:**

(1) Reaching: Extending the hands and arms in any direction.
(2) Handling: Seizing, holding, grasping, turning, or otherwise working with the hand or hands (fingering not involved).
(3) Fingering: Picking, pinching, or otherwise working with the fingers primarily (rather than with the whole hand or arm as in handling).
(4) Feeling: Perceiving such attributes of objects and materials as size, shape, temperature, or texture, by means of receptors in the skin, particularly those of the finger tips.

5 **Talking and/or Hearing:**

(1) Talking: Expressing or exchanging ideas by means of the spoken word.
(2) Hearing: Perceiving the nature of sounds by the ear.

6 **Seeing:**

Obtaining impressions through the eyes of the shape, size, distance, motion, color, or other characteristics of objects. The major visual functions are: (1) acuity, far and near, (2) depth perception, (3) field of vision, (4) accommodation, (5) color vision. The functions are defined as follows:

(1) Acuity, far—clarity of vision at 20 feet or more.
Acuity, near—clarity of vision at 20 inches or less.
(2) Depth perception—three dimensional vision. The ability to judge distance and space relationships so as to see objects where and as they actually are.
(3) Field of vision—the area that can be seen up and down or to the right or left while the eyes are fixed on a given point.

(4) Accommodation—adjustment of the lens of the eye to bring an object into sharp focus. This item is especially important when doing near-point work at varying distances from the eye.
(5) Color vision—the ability to identify and distinguish colors.

VI. WORKING CONDITIONS

Working conditions are the physical surroundings of a worker in a specific job.

1 Inside, Outside, or Both:

I Inside: Protection from weather conditions but not necessarily from temperature changes.
O Outside: No effective protection from weather.
B Both: Inside and outside.

A job is considered "inside" if the worker spends approximately 75 per cent or more of his time inside, and "outside" if he spends approximately 75 per cent or more of his time outside. A job is considered "both" if the activities occur inside or outside in approximately equal amounts.

2 Extremes of Cold Plus Temperature Changes:

(1) Extremes of Cold: Temperature sufficiently low to cause marked bodily discomfort unless the worker is provided with exceptional protection.
(2) Temperature Changes: Variations in temperature which are sufficiently marked and abrupt to cause noticeable bodily reactions.

3 Extremes of Heat Plus Temperature Changes:

(1) Extremes of Heat: Temperature sufficiently high to cause marked bodily discomfort unless the worker is provided with exceptional protection.
(2) Temperature Changes: Same as **2** (2).

4 Wet and Humid:

(1) Wet: Contact with water or other liquids.
(2) Humid: Atmospheric condition with moisture content sufficiently high to cause marked bodily discomfort.

5 Noise and Vibration:

Sufficient noise, either constant or intermittent, to cause marked distraction or possible injury to the sense of hearing and/or sufficient vibration (production of an oscillating movement or strain on the body or its extremities from repeated motion or shock) to cause bodily harm if endured day after day.

6 Hazards:

Situations in which the individual is exposed to the definite risk of bodily injury.

7 Fumes, Odors, Toxic Conditions, Dust, and Poor Ventilation:

(1) Fumes: Smoky or vaporous exhalations, usually odorous, thrown off as the result of combustion or chemical reaction.
(2) Odors: Noxious smells, either toxic or nontoxic.
(3) Toxic Conditions: Exposure to toxic dust, fumes, gases, vapors, mists, or liquids which cause general or localized disabling conditions as a result of inhalation or action on the skin.
(4) Dust: Air filled with small particles of any kind, such as textile dust, flour, wood, leather, feathers, etc., and inorganic dust, including silica and asbestos, which make the workplace unpleasant or are the source of occupational diseases.
(5) Poor Ventilation: Insufficient movement of air causing a feeling of suffocation; or exposure to drafts.

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D.O.T. APPENDIX B

Explanation of Worker Trait Components

Those abilities, personal traits, and individual characteristics required of a worker in order to achieve average successful job performance are referred to as worker traits. Occupational information presented in volumes I and II is based in part on analysis of required worker traits in terms of the six distinct worker trait components described in this appendix. These six components have been selected for this purpose because they provide the broadest and yet most comprehensive framework for the effective presentation of worker trait information. Within this framework the user will find data concerning the requirements of jobs for: (1) The amount of general educational development and specific vocational preparation a worker must have, (2) the specific capacities and abilities required of him in order to learn or perform certain tasks or duties, (3) preferences for certain types of work activities or experiences considered necessary for job success, (4) types of occupational situations to which an individual must adjust, (5) physical activities required in work situations, and (6) physical surroundings prevalent in jobs.

Information reflecting significant worker trait requirements is contained, explicitly or by implication, in the job definitions in volume I. In the Worker Traits Arrangement in volume II, the qualifications profile for each worker trait group shows the range of required traits and/or levels of traits for the first five of these components. Numbers or letters are used to identify each specific trait and level. In this appendix, these identifying numbers and letters appear in italics.

The worker trait components are:

I. Training time (general educational development, specific vocational preparation)
II. Aptitudes
III. Interests
IV. Temperaments
V. Physical demands
VI. Working conditions [1]

I. Training Time

The amount of general educational development and specific vocational preparation required for a worker to acquire the knowledge and abilities necessary for average performance in a particular job.

General Educational Development: This embraces those aspects of education (formal and informal) which contribute to the worker's (a) reasoning development and ability to follow instructions, and (b) acquisition of "tool" knowledges, such as language and mathematical skills. It is education of a general nature which does not have a recognized, fairly specific, occupational objective. Ordinarily such education is obtained in elementary school, high school, or college. It also derives from experience and individual study.

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[1] Working conditions were recorded as part of each job analysis, and are reflected, when appropriate, in job definitions in volume I. However, because they did not contribute to the homogeneity of worker trait groups, they do not appear as a component in the Worker Traits Arrangement.

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The following is a table explaining the various levels of general educational development.

GENERAL EDUCATIONAL DEVELOPMENT

vel	Reasoning Development	Mathematical Development	Language Development
6	Apply principles of logical or scientific thinking to a wide range of intellectual and practical problems. Deal with nonverbal symbolism (formulas, scientific equations, graphs, musical notes, etc.) in its most difficult phases. Deal with a variety of abstract and concrete variables. Apprehend the most abstruse classes of concepts.	Apply knowledge of advanced mathematical and statistical techniques such as differential and integral calculus, factor analysis, and probability determination, or work with a wide variety of theoretical mathematical concepts and make original applications of mathematical procedures, as in empirical and differential equations.	Comprehension and expression of a level to —Report, write, or edit articles for such publications as newspapers, magazines, and technical or scientific journals. Prepare and draw up deeds, leases, wills, mortgages, and contracts. —Prepare and deliver lectures on politics, economics, education, or science. —Interview, counsel, or advise such people as students, clients, or patients, in such matters as welfare eligibility, vocational rehabilitation, mental hygeine, or marital relations. —Evaluate engineering technical data to design buildings and bridges.
5	Apply principles of logical or scientific thinking to define problems, collect data, establish facts, and draw valid conclusions. Interpret an extensive variety of technical instructions, in books, manuals, and mathematical or diagrammatic form. Deal with several abstract and concrete variables.		
4	Apply principles of rational systems[1] to solve practical problems and deal with a variety of concrete variables in situations where only limited standardization exists. Interpret a variety of instructions furnished in written, oral, diagraminatic, or schedule form.	Perform ordinary arithmetic, algebraic, and geometric procedures in standard, practical applications.	Comprehension and expression of a level to —Transcribe dictation, make appointments for executive and handle his personal mail, interview and screen people wishing to speak to him, and write routine correspondence on own initiative. —Interview job applicants to determine work best suited for their abilities and experience, and contact employers to interest them in services of agency. —Interpret technical manuals as well as drawings and specifications, such as layouts, blueprints, and schematics.
3	Apply common sense understanding to carry out instructions furnished in written, oral, or diagrammatic form. Deal with problems involving several concrete variables in or from standardized situations.	Make arithmetic calculations involving fractions, decimals and percentages.	Comprehension and expression of a level to —File, post, and mail such material as forms, checks, receipts, and bills. —Copy data from one record to another, fill in report forms, and type all work from rough draft or corrected copy. —Interview members of household to obtain such information as age, occupation, and number of children, to be used as data for surveys, or economic studies. —Guide people on tours through historical or public buildings, describing such features as size, value, and points of interest.
2	Apply common sense understanding to carry out detailed but uninvolved written or oral instructions. Deal with problems involving a few concrete variables in or from standardized situations.	Use arithmetic to add, subtract, multiply, and divide whole numbers.	
1	Apply common sense understanding to carry out simple one- or two-step instructions. Deal with standardized situations with occasional or no variables in or from these situations encountered on the job.	Perform simple addition and subtraction, reading and copying of figures, or counting and recording.	Comprehension and expression of a level to —Learn job duties from oral instructions or demonstration. —Write identifying information, such as name and address of customer, weight, number, or type of product, on tags, or slips. —Request orally, or in writing, such supplies as linen, soap, or work materials.

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[1] Examples of "principles of rational systems" are: Bookkeeping, internal combustion engines, electric wiring systems, house building, nursing, farm management, ship lling.

Specific Vocational Preparation: The amount of time required to learn the techniques, acquire information, nd develop the facility needed for average performance in a specific job-worker situation. This training may be cquired in a school, work, military, instutitional, or avocational environment. It does not include orientation raining required of even every fully qualified worker to become accustomed to the special conditions of any new ob. Specific vocational training includes training given in any of the following circumstances:

a. Vocational education (such as high school commercial or shop training, technical school, art school, and that part of college training which is organized around a specific vocational objective);

b. Apprentice training (for apprenticeable jobs only);

c. In-plant training (given by an employer in the form of organized classroom study);

d. On-the-job training (serving as learner or trainee on the job under the instruction of a qualified worker);

e. Essential experience in other jobs (serving in less responsible jobs which lead to the higher grade job or serving in other jobs which qualify).

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The following is an explanation of the various levels of specific vocational preparation.

Level	Time	Level	Time
1	Short demonstration only.	5	Over 6 months up to and including 1 year.
2	Anything beyond short demonstration up and including 30 days.	6	Over 1 year up to and including 2 years.
3	Over 30 days up to and including 3 months.	7	Over 2 years up to and including 4 years.
4	Over 3 months up to and including 6 months.	8	Over 4 years up to and including 10 years.
		9	Over 10 years.

II. APTITUDES

Specific capacities and abilities required of an individual in order to learn or perform adequately a task or job duty.

G INTELLIGENCE: General learning ability. The ability to "catch on" or understand instructions and underlying principles. Ability to reason and make judgments. Closely related to doing well in school.

V VERBAL: Ability to understand meanings of words and ideas associated with them, and to use them effectively. To comprehend language, to understand relationships between words, and to understand meanings of whole sentences and paragraphs. To present information or ideas clearly.

N NUMERICAL: Ability to perform arithmetic operations quickly and accurately.

S SPATIAL: Ability to comprehend forms in space and understand relationships of plane and solid objects. May be used in such tasks as blueprint reading and in solving geometry problems. Frequently described as the ability to "visualize" objects of two or three dimensions, or to think visually of geometric forms.

P FORM PERCEPTION: Ability to perceive pertinent detail in objects or in pictorial or graphic material; To make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.

Q CLERICAL PERCEPTION: Ability to perceive pertinent detail in verbal or tabular material. To observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation.

K MOTOR COORDINATION: Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and quickly.

F FINGER DEXTERITY: Ability to move the fingers and manipulate small objects with the fingers rapidly or accurately.

M MANAUL DEXTERITY: Ability to move the hands easily and skillfully. To work with the hands in placing and turning motions.

E EYE-HAND-FOOT COORDINATION: Ability to move the hand and foot coordinately with each other in accordance with visual stimuli.

C COLOR DISCRIMINATION: Ability to perceive or recognize similarities or differences in colors, or in shades or other values of the same color; to identify a particular color, or to recognize harmonious or contrasting color combinations, or to match colors accurately.

Explanation of Levels

The digits indicate how much of each aptitude the job requires for satisfactory (average) performance. The average requirements, rather than maximum or minimum, are cited. The amount required is expressed in terms of equivalent amounts possessed by segments of the general working population.

The following scale is used:

1 The top 10 percent of the population. This segment of the population possesses an extremely high degree of the aptitude.

2 The highest third exclusive of the top 10 percent of the population. This segment of the population possesses an above average or high degree of the aptitude.

3 The middle third of the population. This segment of the population possesses a medium degree of the aptitude, ranging from slightly below to slightly above average.

4 The lowest third exclusive of the bottom 10 percent of the population. This segment of the population possesses a below average or low degree of the aptitude.

5 The lowest 10 percent of the population. This segment of the population possesses a negligible degree of the aptitude.

Significant Aptitudes

Certain aptitudes appear in boldface type on the qualifications profiles for the worker trait groups. These aptitudes are considered to be occupationally significant for the specific group; i.e., essential for average successful job performance. All boldface aptitudes are not necessarily required of a worker for each individual job within a worker trait group, but some combination of them is essential in every case.

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III. INTERESTS

Preferences for certain types of work activities or experiences, with accompanying rejection of contrary types of activities or experiences. Five pairs of interest factors are provided so that a positive preference for one factor of a pair also implies rejection of the other factor of that pair.

1	Situations involving a preference for activities dealing with things and objects.	vs.	*6*	Situations involving a preference for activities concerned with people and the communication of ideas.
2	Situations involving a preference for activities involving business contact with people.	vs.	*7*	Situations involving a preference for activities of a scientific and technical nature.
3	Situations involving a preference for activities of a routine, concrete, organized nature.	vs.	*8*	Situations involving a preference for activities of an abstract and creative nature.
4	Situations involving a preference for working for people for their presumed good, as in the social welfare sense, or for dealing with people and language in social situations.	vs.	*9*	Situations involving a preference for activities that are nonsocial in nature, and are carried on in relation to processes, machines, and techniques.
5	Situations involving a preference for activities resulting in prestige or the esteem of others.	vs.	*0*	Situations involving a preference for activities resulting in tangible, productive satisfaction.

IV. TEMPERAMENTS

Different types of occupational situations to which workers must adjust.

1 Situations involving a variety of duties often characterized by frequent change.
2 Situations involving repetitive or short cycle operations carried out according to set procedures or sequences.
3 Situations involving doing things only under specific instruction, allowing little or no room for independent action or judgment in working out job problems.
4 Situations involving the direction, control, and planning of an entire activity or the activities of others.
5 Situations involving the necessity of dealing with people in actual job duties beyond giving and receiving instructions.
6 Situations involving working alone and apart in physical isolation from others, although the activity may be integrated with that of others.
7 Situations involving influencing people in their opinions, attitudes, or judgments about ideas or things.
8 Situations involving performing adequately under stress when confronted with the critical or unexpected or when taking risks.
9 Situations involving the evaluation (arriving at generalizations, judgments, or decisions) of information against sensory or judgmental criteria.
0 Situations involving the evaluation (arriving at generalizations, judgments, or decisions) of information against measurable or verifiable criteria.
X Situations involving the interpretation of feelings, ideas, or facts in terms of personal viewpoint.
Y Situations involving the precise attainment of set limits, tolerances, or standards.

V. PHYSICAL DEMANDS

Physical demands are those physical activities required of a worker in a job.

The physical demands referred to in this Dictionary serve as a means of expressing both the physical requirements of the job and the physical capacities (specific physical traits) a worker must have to meet the requirements. For example, "seeing" is the name of a physical demand required by many jobs (perceiving by the sense of vision), and also the name of a specific capacity possessed by many people (having the power of sight). The worker must possess physical capacities at least in an amount equal to the physical demands made by the job.

The Factors

1 **Lifting, Carrying, Pushing, and/or Pulling (Strength).** These are the primary "strength" physical requirements, and generally speaking, a person who engages in one of these activities can engage in all.

Specifically, each of these activities can be described as:

(1) Lifting: Raising or lowering an object from one level to another (includes upward pulling).
(2) Carrying: Transporting an object, usually holding it in the hands or arms or on the shoulder.
(3) Pushing: Exerting force upon an object so that the object moves away from the force (includes slapping, striking, kicking, and treadle actions).
(4) Pulling: Exerting force upon an object so that the object moves toward the force (includes jerking).

The five degrees of Physical Demands Factor No. 1 (Lifting, Carrying, Pushing, and/or Pulling), are as follows:

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Mid-Hudson Career Development and Information Center, 88 Sargent Avenue, Beacon, New York 12508. A complete catalog is available upon request. Resources available include the following:

1. Speakers Bureau
2. Field Trips
3. Video Tapes (Occupational)
4. Audio Tapes (careers on the job interviews)
5. Sound Filmstrips (available for one week loan)
6. Books and Pamphlets
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